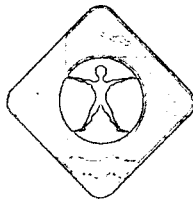


**SITE INSPECTION REPORT  
THE CLOROX COMPANY OF PR  
CAGUAS, PUERTO RICO**

CERCLIS ID No.: PRD090473398



August 10, 2006

VOLUME 1 OF 7

Prepared for:

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**

Prepared by:

**PUERTO RICO ENVIRONMENTAL QUALITY BOARD  
EMERGENCY RESPONSE AND SUPERFUND PROGRAM  
SUPERFUND PA/SI DIVISION  
SAN JUAN, PUERTO RICO 00926**

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**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**

August 10, 2006

SUBMITTED BY:

N. Hernández Morales  
Nereida Hernández Morales  
Project Manager

Date: Sept. 11, 2006

Miguel A. Maldonado Negrón  
Miguel A. Maldonado Negrón  
Chief  
Superfund PA/SI Division

Date: Sept. 18, 2006

## **SITE SUMMARY AND RECOMMENDATION**

The Clorox Company of Puerto Rico (CCPR) is an active facility that has been operating in the same location since 1975. CCPR is located on State Road # 1, Km. 27.1, Ramal 798, Caguas, Puerto Rico (**Figure 1**). The geographic coordinates of the site are 18.29789° N latitude and 66.06116° W longitude, as determined using the Garmin GPS III Plus personal navigator. The owner and operator of the property is CCPR. The site consists of two structures, one of these structures (main structure on the north and northwest side of the property) is used as office space, manufacture, and storage for the raw materials; and the other structure (on the east side of the property) is used as a warehouse. The site is located on a hilly region surrounded by light industries and commercial businesses. To the north it is Junker Pito, a local paved road, and a Texaco Gas Station, to the east are an abandoned lot and Junker Correa, to the south are approximately thirteen (13) residences, and to the west is Road #798 (**Figures 2, 2A and 3**). The property is of approximately 4.8 acres in size.

### **References: 1 through 10.**

During a file search and visual inspection performed on October 25, 2005 by personnel from the Puerto Rico Environmental Quality Board (PREQB), Superfund PA/SI Division, it was found that before CCPR, a company involved in the manufacture of mattresses occupied the property, but the specific name and time of operations were not specified. The CCPR started operations in 1975 and is involved in the manufacture and distribution of household cleaning products (e.g. bleach, Lestoil®, Tylex®, Mistolin®, among others). Some substances or raw materials present at the site during the visual inspection were: sodium hypochlorite, caustic soda, potassium iodide, sodium thiosulfate, hydrochloric acid, potassium ferrocyanide, hydrogen peroxide 30%, ammonia, butanol, sodium carbonate, nitric acid, sodium tartrate, and dimethylglyoxime. The general process for the manufacture of cleaning products consists of the following: mix water with caustic soda (NaOH) in a reactor, metals separation (using the bicarbonate phase), filter aid process, then the remaining sludge and the effluents are sent to a container of approximately 12,000 gallons where Browning Ferris Industries (BFI) disposes of approximately 4,500 gallons of sludge annually, while the effluents are recycled and reused during the process. The sludge is disposed in a municipal landfill as a non-hazardous material. The wastes generated are

characterized twice a year. During past activities (year 1991), the company was involved in the manufacture of plastic bottles. There are approximately 70 employees working one shift. There are storm water sewers and a drainage ditch that discharges into the Cañas River (Río Cañas), and there are four (4) private residences contiguous to the site boundaries. The company has permits from the federal (storm water permit) and state (two air permits and an underground injection control (UIC) permit) regulatory agencies. According to Mr. Radamés Cobos, Engineering Manager of The Clorox Company of Puerto Rico, no spill has occurred at CCPR in all their years of operation.

**References: 2 through 16.**

Several inspections performed by personnel from the PREQB Land Regulation Program it was found that the company appear to generate no hazardous waste; however, from the year 1999 to 2005 the PREQB Complaint Office has received various complaints against The Clorox Company of Puerto Rico. The complaints are concerning to strong odors, noise, and water discharges (soapy and foamy) coming from The Clorox Company of Puerto Rico and released into the environment. According to the complaints received, the water discharges occurred mostly during the rainy days. The complaint dated April 3, 2000 specified about a release of Clorox to the air, occurred in the year of 1986, and a fire occurred at the property of CCPR on March 25, 2000. The fire occurred in the warehouse that CCPR uses to store the empty bottles and boxes. According to inspections performed by PREQB personnel no hazardous wastes were generated during the event.

**References: 10, and 17 through 25.**

Groundwater within 4 miles of The Clorox Company of PR site is used for drinking water purposes. There are several municipal and private wells within a 4-mile radius from the site. The municipal wells are located up gradient from the site. These wells are connected to Caguas Urbano (a.k.a. Caguas Sur) and Caguas Norte filter plants, which are also located up gradient from the site. There are two (2) onsite wells that the company uses for industrial purposes. There is a private well located at Caribe Paint, Corp. that is located within a ¼ to 2-mile radius from the site. This well is used by the company for the manufacturing process. During the



drought seasons, the employees take home the water from the onsite well and use it for personal and drinking purposes. Three (3) additional private wells are located within a ¼ to ½-mile radius from the site. These wells are used to distribute bottled water around the island for industrial purposes. According to the United States Geological Survey (USGS) the site is located in the Bayamón-Loíza Region of the groundwater resources area, which consists of three (3) major rocks types: volcanic rock, consolidated sedimentary rock, and unconsolidated Quaternary surficial deposits. The USGS Map I-479 indicates that the soil in this area corresponds mostly to Terrace Deposits consisting of sand, gravel, silt, and clay. However, according to a preliminary subsurface exploration conducted by Vázquez Castillo / Rodríguez Molina Geotechnical and Engineering Geology Consultants, the geology conditions at the site corresponds to Santa Olaya Lava. The study revealed the presence of a silty clay and or clayey silt, soft to stiff in consistency. Groundwater in the area is found at 30 to 40 feet below ground surface.

**References: 1, 4, 26 through 43; and Figures: 1 and 2.**

To the south-southwest side of the property is a slope that descends towards the Cañas River located at approximately 0.19 miles (i.e. Río Cañas), which in turn converges into the Loíza River (i.e. Río Grande de Loíza) at 2.4 miles downstream from the site. The Loíza River converges into the Loíza Lake (a.k.a. Trujillo Alto Lake, Carraízo Lake), which is used for fishing and drinking water purposes. The population served by the Loíza Lake (Carraízo Dam) is approximately 1,000,000 persons; this is the major source of drinking water supply for the San Juan metropolitan area. Both water bodies (Loíza River and Loíza Lake) have many designated areas for shore fishing. Among the species caught in the Loíza River are: shadfish (*Alosa vulgaris*, “sábalo”), bassfish (*Morone labrax*, “róbalo”), and shrimps, among others. Among the species caught in the Loíza Lake are: largemouth bass (*Micropterus salmoides*, “lobina”), redear sunfish (*Lepomis microlophus*, “chopa caracolera”), bluegill (*Lepomis macrochirus*, “chopa”), channel catfish (*Ictalurus punctatus*, “barbudo de canal”), and peacock bass (*Cichla ocellaris*, “tucunaré”). The Cañas River is also used for occasional fishing. Two critical wildlife areas have been identified within a 4-mile radius from the site. These are the Trujillo Alto Lake and Lake Bairoa La 25. Trujillo Alto Lake supports a large variety of aquatic birds (Purple gallinule – *Porphyryula martinica*, Caribbean coot – *Fulica caribaea*, and the rare Least grebe –

*Tachybaptus dominicus*. Lake Bairoa La 25 is a segment of Río Grande de Loíza that has been identified by the PR Department of Natural and Environmental Resources (DNER) as an important support area for a great variety of wildlife such as: Black-crowned night heron – *Nycticorax nycticora*, Great blue heron – *Ardea herodias*, Little blue heron – *Egretta caerulea*, Snowy egret – *E. thula*, Tricolored heron – *E. tricolor*, Puerto Rico Plain pigeon – *Patagioenas inornata*, West Indian tree duck – *Dendrocygna arborea*. The PR Plain pigeon - *Patagioenas inornata*, and the West Indian tree duck – *Dendrocygna arborea* are also considered federal and state endangered species. The population within a 4-mile radius from the site is approximately 138,022 persons.

**References: 1, 2, 11, and 44 through 50.**

This site was recommended for further investigation under the Superfund PA/SI Division due to the lack of information concerning the characterization of the wastes. The sludge is disposed as non-hazardous waste in a municipal landfill and other wastes that cannot be reused are donated or sold to other companies. There was also a concern with one of two onsite groundwater wells (west well) that during two different sampling events conducted between April-May, 2005 showed concentrations of barium, chloroform, bromodichloromethane, and tetrachloroethene (PCE) three times (3X) above the background concentration or were greater than the Environmental Protection Agency (EPA) Contract Required Quantitation Limits (CRQL's). In order to characterize the sources (i.e. surface soil, sludge (sample collected as sediment), and wastewater) identified at the property of CCPR from March 7-14, 2006 through a legal order, the PREQB Superfund PA/SI personnel got access to The Clorox Company of Puerto Rico where fourteen (14) surface soil, seven (7) sediment, seven (7) surface water, one (1) wastewater, and seven (7) groundwater samples were collected at the site and its surroundings (**Figures 2 through 5**). The analytical results revealed that soil, sediment, and water samples collected showed concentrations of organic, inorganic, pesticides, and aroclors greater than the CRQL's or are three times (3X) above the background concentration. From the samples collected onsite at the three different sources identified in CCPR the contaminants found were: **aluminum, barium, cadmium, calcium, chromium, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, sodium, zinc, acetone, chloromethane, bromomethane, methylene chloride, 2-**

butanone, chloroform, carbon tetrachloride, bromodichloromethane, dibromochloromethane, bromoform, benzaldehyde, n-nitrosodiphenylamine, fluoranthene, pyrene, di-n-butylphthalate, butylbenzyl phthalate, bis(2-ethylhexyl)phthalate, benzo(g,h,i)perylene, heptachlor epoxide, 4,4'-DDE, alpha chlordane, gamma chlordane, aroclor-1260, and presumptive evidence of other unknown substances were also detected. Toluene and 2-butanone were detected at the **surface soil** samples collected at the nearest residences that are located at 200 feet or less from the site. Toluene was not detected in the onsite samples collected, but it is a component of the hydrocarbon solvent that is included in the Material Safety Data Sheets (MSDS) provided by CCPR. The **surface water** samples collected at two different probable points of entries (PPE) or downstream from the site revealed high concentrations of acetone, manganese, and methylene chloride. Aroclor-1260 was found in **sediment sample** (SD-04) collected at the PPE #2 (See Figure 5). **Groundwater** samples collected at the two different wells (east well – 540 feet deep and west well – 600 feet deep) located onsite CCPR property, revealed concentrations of barium, methylene chloride, chloroform, benzene, and 1,2, dichloroethane. In addition, one (1) of three (3) groundwater samples collected down gradient from the site revealed concentrations of mercury. Mercury was also detected in the wastewater sample collected from a tank used by CCPR to store the effluents coming from the manufacturing process and is a component (90-100%) of the quicksilver that is included in the MSDS provided by the CCPR. During two different sampling events conducted between April-May, 2005 concentrations of chloroform were detected at the groundwater sample collected from the west well located onsite of CCPR at concentrations (160 µg/L and 180 J µg/L, respectively) that exceeded three times (3X) the background levels or were greater than the CRQL's.

**References: 2, 3, and 44 through 67.**

From the contaminants mentioned before, methylene chloride (6.4 µg/L), chloroform (230 µg/L), benzene (5.6 µg/L), and 1,2, dichloroethane (7.2 µg/L) exceeded the Maximum Contaminant Levels (MCL's) for the drinking water standards. Methylene chloride was also detected at concentrations between 6-12 µg/L at the surface water samples collected (downstream and in the PPE's) from the Cañas River above the MCL's. The Cañas River converges into the Loíza River

which in turn converges into the Loíza Lake. These water bodies are used for fishing purposes. Loíza Lake is also used for drinking water purposes supplying a population of approximately 1,000,000 persons.

**References: 2, 3, and 44 through 68.**

According to the analytical results, an observed release to the surface soil, groundwater, and surface water can be attributed to the site, documented by chemical analysis, and confirmed through the MSDS documentation provided by CCPR . **Aluminum, barium, cadmium, calcium, chromium, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, sodium, zinc, chloromethane, bromomethane, methylene chloride, 2-butanone, chloroform, carbon tetrachloride, bromodichloromethane, dibromochloromethane, bromoform, benzaldehyde, n-nitrosodiphenylamine, fluoranthene, pyrene, di-n-butylphthalate, butylbenzyl phthalate, bis(2-ethylhexyl)phthalate, benzo(g,h,i)perylene, heptachlor epoxide, 4,4'-DDE, alpha chlordane, gamma chlordane, aroclor-1260** can be attributed to the site since these contaminants were detected at different sources identified in CCPR and are the constituents of several substances or raw materials used by the company.

**References: 3, 53, and 57 through 67.**

Considering the analytical results, there is a concern of exposure to the personnel working onsite (70 employees) by direct contact with the soil and the nearest residences (13 residences) that are located 200 feet or less from the site. Another concern of exposure is through the surface water pathway since it is used to supply potable water to a population of approximately **1,000,000**. There is also a concern of exposure through the human food chain since fisheries were identified along the surface water pathway, particularly in the Río Cañas (Cañas River), Río Grande Loíza (Loíza River), and Loíza Lake, where fishing activities are documented. There is also a concern through the groundwater pathway, since there is an average population of **10,030** that use the water from the drinking water wells located within a 4-mile radius from the site for personal use. Approximately **138,022** people reside within 4 miles of The Clorox Company of PR site.

**References: 2, 3, 26, 32, 33, 35, 37, 40, 44, 45, 46, 47, and 50 through 64.**

## SITE REASSESSMENT REPORT: SITE INSPECTION REPORT

### PART I: SITE INFORMATION

1. Site Name/Alias The Clorox Company of PR  
Street: State Road #1, Km 27.1, Ramal 798  
City: Caguas State: Puerto Rico Zip Code: 00725
2. County Caguas County Code 025 Cong. Dist. \_\_\_\_\_
3. CERCLIS ID NO. PRD090473398
4. Block No. \_\_\_\_\_ Lot Nos. \_\_\_\_\_
5. Latitude 18.29789° N Longitude 66.06116 ° W  
USGS Quad(s) Caguas, Puerto Rico
6. Approximate size of site 4.8 acres approximately
7. Owner The Clorox Company of PR Telephone No. (787) 641-2500  
Street: State Road #1, Km 27.1, Ramal 798  
City: Caguas State: PR Zip Code: 00725
8. Operator The Clorox Company of PR Telephone No. (787) 641-2500  
Street: State Road #1, Km 27.1, Ramal 798  
City: Caguas State: PR Zip Code: 00725
9. Type of Ownership  
☒ Private    ☐ Federal    ☐ State    ☐ County    ☐ Municipal  
☐ Unknown    ☐ Other
10. Owner/Operator Notification on File  
☐ RCRA 3001 \_\_\_\_\_ Date    ☐ CERCLA 103c \_\_\_\_\_ Date  
☐ None    ☒ Unknown

11. Permit Information

Permit	Permit No.	Date Issued	Expiration Date	Comments
PFE	PFE-13-0105-0007-I-O	03/15/2005	03/15/2010	* Bleach manufacturing area * Filling process
PFE	PFE-13-0306-0376-II-O	03/27/2006	03/27/2011	Electric power generator
UIC	UIC-00-13-0013	11/17/2004	11/16/2006	Underground Injection System Class VC-1 (septic tank)
NPDES	PRR05A828	01/26/2001	N/A	Storm water discharge

12. Site Status

☒ Active

☐ Inactive

☐ Unknown

13. Years of Operation: 1975 - present

14. Identify the types of waste sources (e.g., landfill, surface impoundment, piles, stained soil, above- or below-ground tanks or containers, land treatment, etc.) on site. Initiate as many waste unit numbers as needed to identify all waste sources on site.

(a) Waste Sources

Waste Unit No.	Waste Source Type	Facility Name for Unit
1	Contaminated Soil	Contaminated Soil
2	Drums	Drums / Sludge
3	Tank	Wastewater

(b) Other Areas of Concern

There are thirteen (13) residences located less than 200 feet from the site and at least four of these residences are located contiguous to the site. People from the neighborhood has been complaining to the PREQB Complaint Office about discharges of waters, with a whitish color, coming from The Clorox Company of PR and discharging into the Cañas River.

**References: 2, 3, and 18 through 25.**

15. Describe the regulatory history of the site, including the scope and objectives of any previous response actions, investigations and litigation by State, Local and Federal agencies (indicate type, affiliation, date of investigations).

- ✓ December 21, 1983, letter from the Board of Members, PREQB Chairman's Office sent to Mr. Mario A. Eusebio, Plant Manager of CCPR that recommended the declassification of the company from Hazardous Waste Generator to Non-Hazardous Waste Generator.
- ✓ June 19, 1990, Mr. Ernesto Rosario, PREQB – compliance inspection that recommended the operation permit for the septic tank.
- ✓ October 18, 1990, letter from Mr. Tomás Sanabria, PREQB Director of Water Quality Area, sent to Mr. Radamés Cobos, Plant Engineer of CCPR – second notification for the UIC 84-0248 permit renewal. CCPR was illegally operating an underground injection control system.
- ✓ November 6, 1990, letter from Mr. Radamés Cobos, Plant Engineer of CCPR, sent to Engineer Rubén González, PREQB Water Quality Area - request an extension of time to submit the documents for the UIC renewal permit.
- ✓ December 11, 1990, letter from Mr. Tomás Sanabria, PREQB, Water Quality Area, sent to Mr. Radamés Cobos, Plant Engineer of CCPR - approval of thirty (30) additional days to submit the documentation for the UIC 84-0248 renewal permit.
- ✓ January 2, 1991, report from Mr. Luis Vázquez Castillo, Engineer of Geotechnical and Engineering Geology Consultants, sent to Mr. Radamés Cobos, Plant Engineer of CCPR – report of the preliminary subsurface exploration for the proposed expansion of the facilities of CCPR in Caguas, Puerto Rico.
- ✓ January 11, 1991, letter from Mr. Angel A. Cotté, Plant Manager of CCPR, sent to Mr. Santos Rohena, Chairman of the PREQB – the letter indicates that CCPR is responsible for the operation and maintenance of the two injection wells located at the CCPR.

- ✓ February 7, 1991 – inspection performed by PREQB-UIC personnel to determine compliance with the state regulations. During the inspection it was found that the injection well #2 was full of sanitary waters.
- ✓ September 24, 1991 – Resource Conservation and Recovery Act (RCRA) Re-classified Facility Inspection performed by PREQB Land Pollution Control Area personnel on August 19, 1991 to CCPR in order to verify the compliance with the Regulation for the Control of Hazardous and Non-Hazardous Solid Waste and the federal regulation 40 CFR. During the inspection it was found that the company appears to generate non hazardous wastes.
- ✓ November 25, 1991, letter by Ms. Flor del Valle, Director of the PRQB Land Pollution Control Area, sent to Mr. Angel A. Cotté, Plant Manager of CCPR, requesting the characterization of the remaining sludge generated during the manufacturing process.
- ✓ February 24, 1992, letter by Mr. Radamés Cobos, Plant Engineer of CCPR, sent to Ms. Flor del Valle, Director of PREQB Land Pollution Control Area, submitting the analytical results for Toxicity Characteristic Leaching Procedure (TCLP) for the filter cake sludge.
- ✓ March 12, 1993 inspection report - on February 26, 1993 PREQB UIC personnel performed an NPDES compliance inspection before the renewal of the UIC permit.
- ✓ April 13, 1993, letter by Ms. Lucinia Ghigliotty, Acting Chief of PREQB Water Quality Area, sent to Mr. Radamés Cobos, Plant Engineer of CCPR, requesting additional information before the PREQB granted the renewal of the UIC permit; including the disposal of the sludge generated during the manufacturing process.
- ✓ May 6, 1993, letter by Mr. Radamés Cobos, Plant Engineer of CCPR, sent to Ms. Lucinia Ghigliotty, Acting Chief of PREQB Water Quality Area, answering the letter sent on April 13, 1993. The information provided by the company also indicated that the Browning Ferris Industries (BFI) disposes off the sludge generated during the manufacturing process in a municipal landfill as non-hazardous wastes.
- ✓ February 1, 1999 – the PREQB Complaint Office received a complaint from Mr. Ricardo Burgos, resident of the area, requesting further investigation to CCPR due to strong odors coming from CCPR.
- ✓ April 3, 2000 – letter by Ms. Leonides Caballer, nearest resident of CCPR, sent to the PREQB requesting further investigation to CCPR due to strong odors, noise, and water discharges (with bleach) coming from CCPR.
- ✓ May 12, 2000 inspection report - on April 27, 2000 personnel from the PREQB Land Pollution Regulation Program investigated CCPR to determine compliance with the Federal Resource Conservation and Recovery Act and the State Regulations for the



Control of Hazardous Solid Wastes (RCHSW) and found that CCPR does not generate hazardous wastes.

- ✓ October 4, 2001 – letter by Ms. Leonides Caballer, nearest resident of CCPR, sent to the PREQB requesting further investigation to CCPR due to strong odors, noise, garbage, and water discharges coming from CCPR.
- ✓ April – May 2005 – Personnel from PREQB Superfund PA/SI Division performed two different sampling events where groundwater samples were collected at the CCPR onsite well (west well). High concentrations of barium, chloroform, bromodichloromethane, and tetrachloroethene were detected three times (3X) above the background concentration or were greater the CRQL's.
- ✓ July 8, 2005 – the PREQB Complaint Office received a complaint from Ms. Aida Pizarro, resident of the area, requesting further investigation to CCPR due to sanitary water discharges coming from CCPR.
- ✓ September 2005 – USEPA Headquarters, USEPA Caribbean Field Office, and PREQB Air Quality Program performed an inspection to audit the CCPR to determine compliance with the Clean Air Act Regulations. Some findings and recommendations were found during the audit.
- ✓ October 25, 2005 – PREQB Superfund PA/SI Division personnel visited the CCPR property that revealed irregularities concerning the characterization and disposal of the wastes. Due to the irregularities found during the site visit and the findings on the two different sampling events conducted between April-May 2005 the site was recommended for further investigation under the Superfund PA/SI Division.
- ✓ October 31, 2005 – letter by Ms. Leonides Caballer, nearest resident of CCPR, sent to the PREQB requesting further investigation to CCPR due to strong odors, noise, and water discharges (with soap) into the Cañas River coming from CCPR.
- ✓ November 4, 2005 – the PREQB Complaint Office received a complaint from Ms. Leonides Caballer, nearest resident of CCPR requesting further investigation to CCPR due to strong odors, chemical, coming from CCPR.
- ✓ November 14, 2005 – letter by Ms. Leonides Caballer, nearest resident of CCPR, sent to Nereida Hernández, PREQB Superfund PA/SI Division, requesting further investigation to CCPR. According to Ms. Leonides, CCPR continues with the same environmental problems.
- ✓ March 7, 2006 – Legal Order that granted the access for the sampling event conducted from March 7-14, 2006.

- ✓ March 20, 2006 – Nereida Hernández, PREQB Superfund PA/SI Division, received from Ms. Leonides Caballer, nearest resident of CCPR supporting documentation (file with photos) that documents some of the complaints specified before.

**References: 7, 9, 10, 11, 18 through 25, 43, 60, and 69 through 79.**

- a) Is the site or any waste source subject to Petroleum Exclusion? Identify petroleum products and by products that justify this decision.

Available analytical data cannot confirm or deny the existence of petroleum products.

**References: 53, 58, 65, 77, and 79.**

- b) Has normal farming application of pesticides registered under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) occurred at the site? Have pesticides been produced or stored at the site? Have there been any leaks or spills of pesticides on site?

Based on available background information, the site has not been used for agricultural purposes. Therefore, pesticides regulated under FIFRA are not known to have been used or applied at the site.

**References: 2, 3, 7, 9, 11, 43, and 75.**

- c) Is the site or any waste source subject to RCRA Subtitle C (briefly explain)?

Based on available background information, the site is not subject to RCRA Subtitle C regulations.

**References: 2, 3, 7, and 10.**

- d) Is the site or any waste source maintained under the authority of the Nuclear Regulatory Commission (NRC)?

Neither the site nor any waste source at the site is maintained under the authority of the NRC.

**References: 2, 3, 7, 9, 10, and 11.**

16. Do any conditions exist on site, which would warrant immediate or emergency action?

During the Screening Site Inspection conducted by PREQB Superfund PA/SI Division personnel From March 7-14, 2006, no conditions were noted which would warrant immediate or emergency removal action.

**References: 60 through 65.**

17. Information available from:

Contact Miguel A. Maldonado Agency PREQB Telephone No.: (787) 767-8181  
Ext. 3206

Prepared Nereida Hernández Agency PREQB Date: August 10, 2006

## PART II: WASTE SOURCE INFORMATION

For each of the waste units identified in Part I, complete the following items.

Waste Unit                    1                    -                    Contaminated Soil

### Source Type

- |  |  |
|--|--|
| <input type="checkbox"/> Landfill            | <input checked="" type="checkbox"/> <b>Contaminated Soil</b> |
| <input type="checkbox"/> Surface Impoundment | <input type="checkbox"/> Pile                                |
| <input type="checkbox"/> Drums               | <input type="checkbox"/> Land Treatment                      |
| <input type="checkbox"/> Tanks/Containers    | <input type="checkbox"/> Other                               |

### Description:

1. Describe the types of containers, impoundments, or other storage systems (i.e., concrete-lined surface impoundments) and any labels that may be present.

The site consists of approximately 4.8 acres. The Clorox Company of PR is an active facility that has been operating in the same location since year 1975. The site consists of two structures, one of these structures (main structure on the north and northwest side of the property) is used as office space, manufacture and storage for the raw materials; and the other structure (on the east side of the property) is used as a warehouse. During the visual inspection performed to the site and its surroundings on October 25, 2005, our personnel observed that the superficial area is partially covered with gravel and cement. Between the main building and the warehouse storage building there is a corridor that connects with the backyard of the main building. This corridor is paved and has more than 70 unlabeled metal and plastics drums of 55-gallons each. According to Mr. Cobos, these drums are filled with wastes that cannot be reused; therefore, these are sold or donated to any institution. The drums were observed over wooden pallets in an unroofed area and exposed to the weather conditions. This area does not have a containment system to prevent any spill from flowing outside the property boundaries. There is a private residence located next to this area. On March 1<sup>st</sup>, 2006 Ms. Leonides Caballer, owner of the nearest residence, took a photo that showed several drums (mostly plastic drums of 55-gallons each) that, according to Ms. Caballer, these drums were leaking onto the soil.

**References: 2, 3, 11, 25, and Figures: 2, 2A and 4.**

2. Describe the physical condition of the containers or storage systems (i.e., rusted and/or bulging drums).

The drums were observed in good conditions over wooden pallets in an unroofed area and exposed to the weather conditions. There is a private residence located next to this area. This area does not have a containment system to prevent any spill from flowing outside the property boundaries. There is a complaint from the nearest neighbor (Ms. Leonides Caballer) about several drums observed next to her property. According to Ms. Caballer, several drums were observed leaking onto the soil. During the sampling event performed from March 7-14, 2006 stressed vegetation was observed on this area; therefore, one surface soil sample was collected to verify migration of contaminants from the site to the nearest property, if any.

**References: 2, 3, 25, 61, 62, 63, 64, and Figures: 2, 2A and 4.**

3. Describe any secondary containment that may be present (e.g., drums on concrete pad in building or aboveground tank surrounded by berm).

There are many drums stored inside the main building. The main building consists of a concrete floor, roof, and have a locked door. The drums located inside the building are located over wooden pallets.

**References: 2 and 3.**

### **Hazardous Waste Quantity**

The total amount of contaminated soil present at the site is unknown. However, the estimated area of observed contamination for The Clorox Company of PR is approximately **371.6 square meters (m<sup>2</sup>) or 4,000 square feet (ft<sup>2</sup>).**

**References: 2, 3, 61, 62, 80, and 81.**

### **Hazardous Substances/Physical State**

The analytical results of the surface soil samples collected onsite at The Clorox Company of PR indicate that the following hazardous substances remain at concentrations above background concentrations, or greater than EPA CRQL's: cadmium, lead, sodium, zinc, methylene chloride, chloroform, n-nitrosodiphenylamine, fluoranthene, pyrene, butylbenzyl phthalate, bis(2-ethylhexyl)phthalate, benzo(g,h,i)perylene, heptachlor epoxide, 4,4'-DDE, alpha chlordane, gamma chlordane, aroclor-1260, and presumptive evidence of other unknown substances were also detected. The analytical results of the surface soil samples collected at the nearest residences indicate that the following hazardous substances remain above background concentrations or greater than EPA CRQL's: acetone, toluene, 2-butanone, and presumptive evidence of other unknown substances were also detected. Toluene was not detected in the onsite samples collected, but it is a component of the hydrocarbon solvent that is included in the

MSDS provided by CCPR. The waste source currently being evaluated is contaminated soil. The contaminants were detected in soil samples, so the physical state of the hazardous substances is solid.

**References: 2, 3, 59, 61, 62, 63, 64, 65, 80, 81; and Figures: 2, 2A and 4.**

**Waste Unit**                        2                        -                      **Drums**

**Source Type**

- |  |  |
|--|--|
| <input type="checkbox"/> Landfill                | <input type="checkbox"/> Contaminated Soil |
| <input type="checkbox"/> Surface Impoundment     | <input type="checkbox"/> Pile              |
| <input checked="" type="checkbox"/> <b>Drums</b> | <input type="checkbox"/> Land Treatment    |
| <input type="checkbox"/> Tanks/Containers        | <input type="checkbox"/> Other             |

**Description:**

1. Describe the types of containers, impoundments, or other storage systems (i.e., concrete-lined surface impoundments) and any labels that may be present.

During the visual inspection performed to The Clorox Company of PR site and its surroundings on October 25, 2005, our personnel observed various types of containers at the site. On the south side of the warehouse storage building many empty metal and plastic drums of 55-gallons each, several unlabeled drums, and one drum labeled as oil with diesel (open on one side of the lid), were observed in this area. Between the main building and the warehouse storage building there is a corridor that connects with the backyard of the main building. This corridor is paved and had more than 70 metal and plastics unlabeled drums of 55-gallons each. According to Mr. Cobos these drums are filled with wastes that cannot be reused; therefore, these are sold or donated to any institution.

On the northwest side of the property there is a roofed structure with two (2) open sides used to collect the sludge in plastics drums of 55-gallons each. Twelve (12) filled drums, two (2) partially filled drums, and six (6) empty drums were observed in this area.

**Reference: 2.**

2. Describe the physical condition of the containers or storage systems (i.e., rusted and/or bulging drums).

The drums observed on the south side of the warehouse storage building were mostly observed in good conditions, and one drum labeled as oil with diesel was open on one side of the lid. These drums were located in an unroofed area and exposed to the weather

conditions. The drums observed between the main building and the warehouse storage building that connects with the backyard of the main building were observed in good conditions over wooden pallets, in an unroofed area, and exposed to the weather conditions. On March 1<sup>st</sup>, 2006 Ms. Leonides Caballer, owner of the nearest residence, took a photo that, showed several drums (mostly plastic drums of 55-gallons each) that according to Ms. Caballer, these drums were leaking onto the soil. During the sampling event performed from March 7-14, 2006 stressed vegetation was observed on this area; therefore, one surface soil sample was collected to verify migration of contaminants from the site to the nearest property, if any.

The drums observed on the northwest side of the property are used to collect sludge and are located over a dike. This sludge is disposed by BFI in a municipal landfill as non-hazardous waste.

**References: 3, 25, 61, 62, 63; and Figures: 2 and 2A.**

3. Describe any secondary containment that may be present (e.g., drums on concrete pad in building or aboveground tank surrounded by berm).

There are no secondary containments on the site for the drums that are kept outside the buildings except for a corridor that connects the main building and the warehouse storage building. This corridor is paved and more than 70 metal and plastics drums of 55-gallons each were observed in this area without a dike or any other secondary containment system to prevent any spill outside the property boundaries. There are many drums stored inside the buildings in areas with that consist of a concrete floor, a roof, and a locked door, but still with no secondary containment system.

**References: 2 and 3.**

### **Hazardous Waste Quantity**

During the visual inspection performed to The Clorox Company of Puerto Rico on October 25, 2005, more than 70 metal and plastic, unlabeled drums of 55-gallons each were observed outside the buildings. According to Mr. Cobos these drums are filled with wastes that cannot be reused; therefore, these are sold or donated to any institution. On the northwest side of the property there is a roofed structure used to collect the sludge from their manufacture process in plastic drums of 55-gallons each. **Twelve (12)** filled drums, two (2) partially filled drums, and six (6) empty drums were observed in this area. These drums are located over a dike. This sludge is disposed by BFI in a municipal landfill. In front of this area (looking west to east) were **two (2)** unlabeled plastic drums with unknown contents and **16 containers of 5-gallons each with paint**. Therefore, the total amount of hazardous waste quantity considered for Hazard Ranking System purposes (HRS) is approximately **4,264 gallons**.

**Hazardous Waste Quantity Calculation:**

- a) 70 drums with wastes of 50-gallons = 3,500 gallons
- b) 12 drums with sludge of 50-gallons = 600 gallons
- c) 2 drums of 50-gallons = 100 gallons
- d) 16 containers of 4-gallons = 64 gallons

**Total = 4,264 gallons**

**References: 2, 3, 61, 62, 80, and 81.**

**Hazardous Substances/Physical State**

The analytical results of the sediment (sludge) sample collected from one of the drums that CCPR uses to store the sludge from their manufacturing process indicates that the following hazardous substances remain at concentrations above background and greater than EPA CRQL's: aluminum, barium, calcium, chromium, copper, iron, lead, magnesium, manganese, nickel, sodium, zinc, methylene chloride, 2-butanone, chloroform, carbon tetrachloride, bromodichloromethane, di-n-butylphthalate, butylbenzyl phthalate, bis(2-ethylhexyl)phthalate, and presumptive evidence of other unknown substances were also detected.. The waste source currently being evaluated is drum. The estimated quantity of hazardous substances considered for HRS purposes is **4,264 gallons**. The contaminants were detected in sediment (sludge) so the physical state of the hazardous substances is solid.

**References: 2, 3, 59, 61, 62, 63, 64, 65, 80, 81; and Figures: 2 and 2A.**

**Waste Unit**                        3                        -                        Tank  

**Source Type**

- |  |  |
|--|--|
| <input type="checkbox"/> Landfill                    | <input type="checkbox"/> Contaminated Soil |
| <input type="checkbox"/> Surface Impoundment         | <input type="checkbox"/> Pile              |
| <input type="checkbox"/> Drums                       | <input type="checkbox"/> Land Treatment    |
| <input checked="" type="checkbox"/> Tanks/Containers | <input type="checkbox"/> Other             |



**Description:**

1. Describe the types of containers, impoundments, or other storage systems (i.e., concrete-lined surface impoundments) and any labels that may be present.

During the visual inspection performed by the PREQB Superfund PA/SI Division personnel on October 25, 2005, three (3) tanks of 10,000 gallons each used to store the raw material used to prepare Lestoil®, and two (2) tanks of 12,000 gallons each used to store the wastes were observed on the south side of the property. According to Mr. Cobos, the wastewaters are recycled and the sludge is disposed by BFI, approximately 4,500 gallons, annually. To the south side of the cylinders storage room, two (2) tanks of approximately 800 gallons each are used as cooling towers (for the dilution of caustic soda), and next to it is a storm water register that discharges the waters into the Cañas River, as observed during the visual inspection. A PVC tube of approximately 8" diameter is used to discharge the effluents into the retention tank of approximately 12,000 gallons. On the north side of the property two (2) tanks (TK 3 and TK 6) of 8,000 gallons each, one (1) tank of 8,000 gallons, and four (4) tanks of 10,000 gallons each are used to store the bleach.

**Reference: 2.**

2. Describe the physical condition of the containers or storage systems (i.e., rusted and/or bulging drums).

The three (3) tanks of 10,000 gallons each used to store the raw material used to prepare Lestoil®, the two (2) tanks of 12,000 gallons each used to store the wastes and observed on the south side of the property; the two (2) tanks (TK 3 and TK 6) of 8,000 gallons each, one (1) tank of 8,000, and four (4) tanks of 10,000 gallons each, used to store the bleach and observed on the north side of the property are not rusted or bulging. The two (2) tanks of approximately 800 gallons each that are used as cooling towers (for the dilution of caustic soda) were also observed in good conditions.

**Reference: 2.**

3. Describe any secondary containment that may be present (e.g., drums on concrete pad in building or aboveground tank surrounded by berm).

The south side of the property that is used as parking is mostly covered with gravel and soil. The three (3) tanks of 10,000 gallons each used to store the raw material used to prepare Lestoil®, the two (2) tanks of 12,000 gallons each used to store the wastes and observed on the south side of the property; the two (2) tanks (TK 3 and TK 6) of 8,000 gallons each, one (1) tank of 8,000, and four (4) tanks of 10,000 gallons each, used to store the bleach and observed on the north side of the property were observed surrounded by a concrete dike but exposed to the weather conditions. The two (2) tanks of approximately 800 gallons each that are used as cooling towers (for the dilution of caustic soda) do not have any secondary containment system to prevent any spill outside the property boundaries. Next to the cooling

towers it is storm water register and on the south side of the property there is also PVC tube of approximately 8" diameter used to discharge the storm waters from CCPR into the Cañas River. The south side of the property has a gentle slope towards the State Road #798 that, according to different complaints received from people of the neighborhood, water with a whitish color has been observed flowing towards the Cañas River.

**References: 2, and 18 through 25.**

### **Hazardous Waste Quantity**

The tanks that CCPR uses to store their effluents are two tanks of 12,000 gallons each; therefore, the hazardous waste quantity used for HRS purposes will be 24,000 gallons.

**References: 2, 3, 61, 62, 80, and 81.**

### **Hazardous Substances/Physical State**

The analytical results of the wastewater sample collected at a tank that CCPR uses to store the effluents coming from the manufacturing process indicates that the following hazardous substances remain at concentrations above background and greater than EPA CRQL's: aluminum, barium, calcium, chromium, copper, iron, magnesium, manganese, mercury, nickel, potassium, sodium, zinc, chloromethane, bromomethane, chloroform, carbon tetrachloride, bromodichloromethane, dibromochloromethane, bromoform, benzaldehyde, bis(2-ethylhexyl)phthalate, and presumptive evidence of other unknown substances were also detected. The waste source currently being evaluated is a tank. The contaminants were detected in a wastewater sample, so the physical state of the hazardous substances is liquid.

**References: 2, 3, 59, 61, 62, 63, 64, 65, 80, 81; and Figures: 2 and 2A.**

### PART III: SAMPLING RESULTS

#### EXISTING ANALYTICAL DATA

During two different sampling events conducted between April-May, 2005 groundwater samples collected at the groundwater well located on the west side of the property, showed concentrations of barium (202µg/L), chloroform (180µg/L), bromodichloromethane (2.5Jµg/L), and tetrachloroethene (0.53J µg/L) in concentrations three times (3X) above background concentrations, or greater than the EPA's Contract Required Quantitation Limits. During this sampling event chloroform exceeded the MCL's for the drinking water standards.

**References: 3, 51 through 59, 67, and 68.**

#### SITE INSPECTION SAMPLING RESULTS

The PREQB Superfund PA/SI Division conducted a sampling event at The Clorox Company of PR site from March 7-14, 2006. The purpose of this investigation is to gather sufficient information to characterize the site that includes the property of The Clorox Company of Puerto Rico and its surroundings. During the sampling event, **fourteen (14) surface soil** ranging in depths from 0 to 2 feet deep, **one (1) wastewater**, **seven (7) groundwater**, **seven (7) surface water**, and **seven (7) sediment samples** were collected from the CCPR site and its surroundings.

The soil samples were collected as follow: **eight (8) surface soil**, including the duplicate, were collected onsite of CCPR property, **four (4) surface soil** samples were collected at the nearest residences located at 200 feet or less from the site, and **two (2)** samples were collected outside at areas presumed to be out of the influence of site activities and contamination for background purposes. **One (1) wastewater** was collected from of the tank used by CCPR to store the effluents coming from the manufacturing process. The **groundwater** samples were collected as follow: **two (2)** samples were collected up gradient for background purposes, **two (2)** samples were collected from the onsite wells (east and west wells), and **three (3)** additional samples were collected down gradient to identify the migration of any contaminants from the site into the groundwater pathway. **Seven (7) surface water** were collected at the Cañas River as follow: **three (3)** samples, including the duplicate, were collected at the probable point of entries (PPE#1 and PPE#2), **two (2)** samples were collected downstream to determine migration of any contaminants from the site into the surface water pathway, and **two (2)** background samples were collected outside the CCPR property boundaries and presumed to be out of the influence of site activities and contamination. In addition, **seven (7) sediment** samples were collected as follow: **two (2)** samples at the probable point of entries (PPE#1 and PPE#2) of Cañas River, **two (2)** downstream samples to determine migration of any contaminants into the surface water pathway, **two (2)** background samples were collected for comparison purposes; and **one (1)** sediment (sludge) sample was collected inside CCPR from one of the drums that the company uses to store the sludge from the manufacturing process. In addition, a Matrix Spike/Matrix Spike Duplicate (MS/MSD), trip blank, field blanks, and field rinsate blank were collected for quality control purposes. A4 Scientific analyzed the soil, sediment, and water for organic compounds (VOA's, BNA's, Pesticides, and PCB's), and the USEPA Lab Region 2 (DESA) analyzed for inorganic compounds (total metals), including mercury and cyanide. The analyses were performed

following the EPA Contract Laboratory Program (CLP) procedures.

**References: 59, and 61 through 64.**

### **Soil Samples**

A total of fourteen (14) surface soil samples were collected from The Clorox Company of PR site and its surroundings. The soil samples were collected as follows: eight (8) surface soil, including the duplicate, were collected onsite of CCPR property, four (4) surface soil samples were collected at the nearest residences located at 200 feet or less from the site, and two (2) samples were collected outside at areas presumed to be out of the influence of site activities and contamination were collected for comparison purposes. Analyses indicated the presence of cadmium, lead, sodium, zinc, acetone, methylene chloride, chloroform, n-nitrosodiphenylamine, fluoranthene, pyrene, butylbenzyl phthalate, bis(2-ethylhexyl)phthalate, benzo(g,h,i)perylene, heptachlor epoxide, 4,4'-DDE, alpha chlordane, gamma chlordane, aroclor-1260, and presumptive evidence of other unknown substances were also detected. Toluene, and 2-butanone were detected at the surface soil samples collected at the nearest residences. Toluene was not detected in the onsite samples collected, but it is a component of the hydrocarbon solvent that is included in the MSDS provided by CCPR. The contaminants mentioned before were detected in concentrations three times (3X) above background concentrations or greater than the EPA CRQL's.

**References: 59, 61, 62, 63, 64, 65; and Figures 2, 2A, and 3.**

Substances	SS-01	SS-02	SS-03	SS-04	SS-05	SS-06	SS-07	SS-08	SS-09	SS-10D	SS-11	SS-12	SS-13	SS-14	CRQL's (mg/kg)
	MB1MQ 2	MB1MQ 3	MB1MQ 4	MB1MQ 5	MB1MQ 6	MB1MQ 7	MB1MQ 8	MB1MQ 9	MB1MR 0	MB1MR 1	MB1MR 2	MB1MR 3	MB1MW 5	MB1MW 6	
<b>Inorganic</b>	Background		Residence	Residence	Residence	Residence	Onsite	Onsite	Onsite	Onsite	Onsite	Onsite	Onsite	Onsite	
Cadmium	0.66	U	U	U	U	U	0.9	U	U	U	2.3	U	U	U	0.5
Sodium	U	U	U	U	U	U	U	U	1,300	1,200	1,500	U	U	U	500
Lead	60	42	16	22	21	10	210	37	50	220	80	23	29	28	1
Zinc	220	86	190	75	110	77	260	350	470	360	4,800	72	90	91	6
<b>Volatiles</b>	B1MQ 2	B1MQ 3	B1MQ 4	B1MQ 5	B1MQ 6	B1MQ 7	B1MQ 8	B1MQ 9	B1MR 0	B1MR 1	B1MR 2	B1MR 3	B1MW 5	B1MW 6	CRQL's (mg/kg)
Acetone	U	0.014	1.1*	U	U	U	U	U	U	U	0.021	U	U		0.01
Methylene chloride	0.0068	0.0081	0.011	U	0.0058	U	U	0.019	0.019	0.015	U	0.022	0.012	0.039	0.005
2-Butanone	U	U	0.018	U	U	U	U	U	U	U	U	U	U	U	0.01
Chloroform	U	U	U	U	U	U	U	U	0.0061	0.0062	U	U	U	U	0.005
Toluene	U	U	0.017	U	U	U	U	U	U	U	U	U	U	U	0.005

mg/kg milligrams per kilogram or parts per million (ppm). Both units are equivalent.

U Material analyzed for but not detected above minimum CRQL's.

**Bold** Sample detected at concentrations three times (3X) above the background or is greater than the CRQL's.

\* Value transferred from dilution

**References: 59, 61, 62, 63, 64, 65; and Figures: 2 and 2A.**

Substances	SS-01	SS-02	SS-03	SS-04	SS-05	SS-06	SS-07	SS-08	SS-09	SS-10	SS-11	SS-12	SS-13	SS-14	CRQL's mg/kg
	B1MQ 2	B1MQ 3	B1MQ 4	B1MQ 5	B1MQ 6	B1MQ 7	B1MQ 8	B1MQ 9	B1MR 0	B1MR 1	B1MR 2	B1MR 3	B1MW 5	B1MW 6	
<b>Semi Volatiles</b>	Background		Residence	Residence	Residence	Residence	Onsite	Onsite	Onsite	Onsite	Onsite	Onsite	Onsite	Onsite	
N-nitrosodiphenylamine	U	U	U	U	U	U	U	U	U	U	<b>0.200 J</b>	U	U	U	<b>0.17</b>
Fluoranthene	U	U	U	U	U	U	U	0.0063 J	0.0033 J	U	<b>0.37</b>	U	U	U	<b>0.17</b>
Pyrene	U	U	U	U	U	U	U	U	U	U	<b>0.52</b>	U	U	U	<b>0.17</b>
Butylbenzyl phthalate	0.045 J	U	U	U	U	U	0.057 J	U	0.093 J	<b>0.190 J</b>	U	U	U	U	<b>0.17</b>
Bis(2-ethylhexyl)phthalate	0.043 J	U	U	U	U	U	<b>0.37</b>	0.034 J	U	0.110J	U	U	U	U	<b>0.17</b>
Benzo(g,h,i)perylene	U	U	U	U	U	U	U	U	U	U	<b>0.4 J</b>	U	U	U	<b>0.17</b>
<b>Pesticides</b>															<b>CRQL's mg/kg</b>
Heptachlor epoxide	U	U	U	U	U	U	U	U	U	U	<b>0.0018 J</b>	U	U	U	<b>0.0017</b>
4,4'-DDE	U	U	U	U	U	U	U	U	U	U	<b>0.012 J</b>	U	U	U	<b>0.0033</b>
Alpha chlordane	U	U	U	U	U	U	U	U	U	U	<b>0.038 J</b>	U	U	U	<b>0.0017</b>
Gamma chlordane	U	U	U	U	U	U	0.0011 J	U	<b>0.00078 J</b>	U	<b>0.020 J</b>	U	U	U	<b>0.0017</b>
Aroclor-1260	U	U	U	U	U	U	0.0011 J	U	U	U	<b>0.31</b>	U	U	U	<b>0.033</b>

mg/kg milligrams per kilogram or parts per million (ppm). Both units are equivalent.

U Material analyzed for but not detected above minimum CRQL's.

J Estimated Value.

**Bold**

Sample detected at concentrations three times (3X) above the background or is greater than the CRQL's.

References: 59, 61, 62, 63, 64, 65; and Figures: 2 and 2A.

### Sediment (SLUDGE – SD-07) Sample:

From March 7-14, 2006 a total of one (1) sediment sample was collected from one of several drums used by CCPR to store the remaining sludge produced during the manufacturing process. The analytical results were compared with the EPA CRQL's. The results indicated the presence of the following contaminants: aluminum, barium, calcium, chromium, copper, iron, lead, magnesium, manganese, nickel, sodium, zinc, methylene chloride, 2-butanone, chloroform, carbon tetrachloride, bromodichloromethane, di-n-butylphthalate, butylbenzyl phthalate, bis(2-ethylhexyl)phthalate, and presumptive evidence of other unknown substances at concentrations greater than the EPA CRQL's.

The results for SD-07 indicated the presence of the following contaminants:

Parameter	Concentration µg/kg	CRQL's µg/kg	Parameter	Concentration µg/kg	CRQL's µg/kg
<b>Inorganic</b>			<b>Volatiles</b>		
Aluminum	1,900,000	20,000	Methylene chloride	15 J	5
Barium	390,000	20,000	2-Butnone	30	10
Calcium	75,000,000	500,000	Chloroform	1,200 J*	5
Chromium	31,000	1,000	Carbon tetrachloride	26 J	5
Copper	37,000	2,500	Bromodichloromethane	26 J	5
Iron	3,600,000	10,000	<b>Semi-Volatiles</b>		<b>CRQL's µg/kg</b>
Magnesium	33,000,000	500,000	Di-n-butylphthalate	660	170
Manganese	44,000	1,500	Butylbenzyl phthalate	240 J	170
Nickel	340,000	4,000	Bis(2-ethylhexyl)phthalate	470	170
Lead	4,900	1,000			
Sodium	62,000,000	500,000			
Zinc	77,000	6,000			

µg/kg Micrograms per kilograms or parts per billion (ppb). Both units are equivalent..

U Material analyzed for but not detected above minimum CRQL's.

J Estimated value.

\* Value transferred from dilution

**References: 59, 61, 62, 63, 64, 65; and Figures: 2 and 2A.**

### Wastewater Sample:

From March 7-14, 2006 a total of one (1) wastewater sample was collected from one tank of 12,000 gallons used by CCPR to store the remaining wastewater produced during the manufacturing process. The analytical results were compared with the EPA CRQL's. The results indicated the presence of the following contaminants: aluminum, barium, calcium, chromium, copper, iron, magnesium, manganese, mercury, nickel, potassium, sodium, zinc, chloromethane, bromomethane, chloroform, carbon tetrachloride, bromodichloromethane, dibromochloromethane, bromoform, benzaldehyde, bis(2-ethylhexyl)phthalate, and presumptive evidence of other unknown substances at concentrations greater than the EPA CRQL's.

The results for WW-01 indicated the presence of the following contaminants:

Parameter	Concentration µg/L	CRQL's µg/L	Parameter	Concentration µg/L	CRQL's µg/L
<b>Inorganic</b>			<b>Volatiles</b>		
Aluminum	780	200	Chloromethane	20	5
Barium	3,400	200	Bromomethane	9.8 J	5
Calcium	420,00	5,000	Chloroform	2,300 *	5
Chromium	150	10	Carbon tetrachloride	26	5
Copper	37	25	Bromodichloromethane	100	5
Iron	1,000	100	Dibromochloromethane	25	5
Magnesium	45,000	5,000	Bromoform	6.6	5
Manganese	31	15	<b>Semi-Volatiles</b>		<b>CRQL's µg/L</b>
Mercury	0.27	0.2	Benzaldehyde	16	5
Nickel	60	40	Bis(2-ethylhexyl)phthalate	7.5 J	5
Potassium	63,000	5,000			
Sodium	8,300,000	5,000			
Zinc	110	60			

µg/L Micrograms per liter or parts per billion (ppb). Both units are equivalent..

U Material analyzed for but not detected above minimum CRQL's.

J Estimated value.

\* Value transferred from dilution

**References: 59, 61, 62, 63, 64, 65; and Figures: 2 and 2A.**



### **Sediment Samples collected from the Cañas River:**

Between March 7-14, 2006 a total of six (6) sediment samples were collected at the Cañas River as follow: two (2) samples at the probable point of entries (PPE #1 and PPE #2) of Cañas River, two (2) downstream samples, and two (2) background samples were collected for comparison purposes. Sample SD-05 and SD-06 were used for background purposes because these are closer to the identified PPE's and similar in environmental conditions. The analytical results were compared with the background samples (SD-05 and SD-06) and the EPA CRQL's.

The results indicated the presence of Aroclor-1260 at concentrations of **180 µg/mg in sediment sample** (SD-04) collected at the PPE #2 (See Figure 3). This contaminant was found in one of the surface soil samples collected during the sampling activities performed from March 7-14, 2006.

**References: 59, 61, 62, 63, 64, 65; and Figure: 5.**

### Surface Water Samples collected from the Cañas River:

Between March 7-14, 2006 a total of seven (7) surface water samples were collected as follow: three (3) samples, including the duplicate sample, at the probable points of entry (PPE) of Cañas River, two (2) downstream samples were collected to identify migration of contaminants from the site to the surface water pathways, and two (2) background samples were collected upstream in areas out of the influence of site activities for comparison purposes. Sample SW-06 and SW-07 were used for background purposes because these are closer to the identified PPE's and similar in environmental conditions. The analytical results were compared with the background samples (SW-06 and SW-07) and the EPA CRQL's. The results indicated the presence of the following contaminants: manganese, acetone, methylene chloride, and presumptive evidence of other substances were detected at concentrations greater than the EPA CRQL's.

Substances	SW-01	SW-02	SW-03	SW-04	SW-05D	SW-06	SW-07	CRQL's µg/L
	MB1MS 7	MB1MS 8	MB1MS 9	MB1MT 0	MB1MT 1	MB1MT 2	MB1MT 3	
<b>Inorganic</b>	<b>Downstream</b>	<b>Downstream</b>	<b>PPE #1</b>	<b>PPE #2</b>	<b>PPE #2</b>	<b>Background</b>	<b>Background</b>	
Manganese	27	16	---	---	---	---	---	15
<b>Volatiles</b>	B1MS 7	B1MS 8	B1MS 9	B1MT 0	B1MT 1	B1MT 2	B1MT 3	<b>CRQL's µg/L</b>
Acetone	U	45	U	U	U	U	U	10
Methylene chloride	U	12	7.1	6	6.7	U	U	5

µg/L Micrograms per liter or parts per billion (ppb). Both units are equivalent..

U Material analyzed for but not detected above minimum CRQL's.

**Bold**

Sample detected at concentrations three times (3X) above the background or is greater than the CRQL's.

**References: 59, 61, 62, 63, 64, 65; and Figure: 5.**

### **Groundwater Samples:**

Seven (7) groundwater samples were collected during this Screening Site Inspection performed from March 7-14, 2006. Two (2) samples and the Matrix Spike/Matrix Spike Duplicate were collected from the two(2) different onsite wells, three (3) samples were collected at different private wells, and two (2) groundwater samples were collected from up gradient private wells for background purposes. The analytical results were compared with the background samples (GW-03 and GW-04) and the EPA CRQL's. **Groundwater** samples collected at the two different wells (east well – 540 feet deep and west well – 600 feet deep) located inside the CCPR property, revealed concentrations of barium, methylene chloride, chloroform, benzene, and 1,2, dichloroethane. One (1) of three (3) groundwater samples collected down gradient from the site revealed concentrations of mercury above the CRQL's. Methylene chloride, chloroform, benzene, and 1,2, dichloroethane exceeded the MCL's for the drinking water standards. Mercury was also detected in the wastewater sample collected from a tank used by CCPR to store the effluents coming from the manufacturing process and it is also a component (90-100%) of the quicksilver that is included in the MSDS provided by the CCPR.

Substances	GW-01	GW-02	GW-03	GW-04	GW-05	GW-06	GW-07	CRQL's µg/L	MCL's µg/L
	MB1MS 1	MB1MS 2	MB1MS 3	MB1MS 4	MB1MS 5	MB1MS 6	MB1MW 4		
<b>Inorganic</b>	<b>Onsite</b>	<b>Down gradient</b>	<b>Background</b>	<b>Background</b>	<b>Onsite</b>	<b>Down gradient</b>	<b>Down gradient</b>		
Barium	<b>290</b>	U	U	U	U	U	U	200	2,000
Mercury	U	U	U	U	U	0.68	U	0.2	2
<b>Volatiles</b>	B1MS 1	B1MS 2	B1MS 3	B1MS 4	B1MS 5	B1MS 6	B1MW 4	CRQL's µg/L	
Methylene chloride	<b>6.4</b>	U	U	U	U	U	U	5	5
Chloroform	<b>230 J</b>	U	U	1.2 J	<b>73</b>	U	U	5	80
Benzene	U	U	U	U	<b>5.6</b>	U	U	5	5
1,2-dichloroethane	U	U	U	U	<b>7.2</b>	U	U	5	5

**MCL's** Maximum Contaminant Levels.

µg/L Micrograms per liter or parts per billion. Both units are equivalent

U Material analyzed for but not detected above minimum CRQL's.

J Estimated value.

**Bold** Sample detected at concentrations three times (3X) above the background or is greater than the CRQL's.

**References: 59, 61, 62, 63, 64, 65; and Figure: 5.**

## **PART IV: HAZARD ASSESSMENT**

### **GROUNDWATER ROUTE**

- 1. Describe the likelihood of a release of contaminant(s) to the groundwater as follows: observed release, suspected release, or none. Identify contaminants detected or suspected and provide a rationale for attributing them to the site. For observed release, define the supporting analytical evidence and relationship to background.**

A release of contaminants to the groundwater is observed and documented through chemical analyses and confirmed through the MSDS documentation provided by The Clorox Company of Puerto Rico. Seven (7) groundwater samples were collected during the Screening Site Inspection performed from March 7-14, 2006. Two (2) samples were collected from two (2) different onsite wells, including a MS/MSD, and three (3) samples were collected from wells located in private companies nearby to determine migration of contaminants to the ground water pathway, if any. Two (2) groundwater samples were collected from up gradient private wells for background purposes. The analytical results were compared with the background samples (GW-03 and GW-04) and the EPA CRQL's. The results indicated the presence of the following contaminants: barium, methylene chloride, chloroform, benzene, and 1,2, dichloroethane. In addition, one (1) of three (3) groundwater samples collected down gradient from the site revealed concentrations of mercury. Mercury was also detected in the wastewater sample collected from a tank used by CCPR to store the effluents coming from the manufacturing process. During two different sampling events conducted between April-May, 2005 chloroform was also detected at the groundwater sample collected from the west well located onsite at concentrations of 160 µg/L and 180 J µg/L, respectively. The contaminants were detected at concentrations three times (3X) above the background concentrations or greater than the EPA CRQL's; and exceeding the MCL's for the drinking water standards. Methylene chloride, chloroform, benzene, and 1,2-dichloroethane are above the MCL's for the drinking water standards. The contaminants mentioned before can be attributed to the site by aqueous (chemical) analysis and confirmed through the MSDS documentation provided by The Clorox Company of PR.

**References: 51 through 67, and Figures: 2 and 2A.**

- 2. Describe the aquifer of concern; include information such as depth, thickness, geologic composition, areas of karst terrain, permeability, overlying strata, confining layers, interconnections, discontinuities, depth to water table, groundwater flow direction.**

The site is located in the Bayamón-Loíza Region of the groundwater resources areas of Puerto Rico, which consists of three major rock types: volcanic rock, consolidated sedimentary rock, and unconsolidated Quaternary surficial deposits. Volcanic rocks from the lower Cretaceous to Middle Eocene Age are the most abundant rock type in this region. Volcanic rock is composed of volcanic tuff, breccia and lava, associated sandstone, siltstone, limestone, and some intrusive igneous rock. Consolidated sedimentary rock is composed of consolidated gravel, sand, clay, and calcareous rock ranging from marl to indurated limestone. The site lies over Pleistocene and terrace unconsolidated deposits of

sand, silt, clay, and gravel overlying limestone formations, which forms the principal aquifer. The potential groundwater yield is 1 to 8 gallons per minute. The depth of this deposit is estimated to 59 feet. However, according to a preliminary subsurface exploration conducted by Vázquez Castillo / Rodríguez Molina Geotechnical and Engineering Geology Consultants, the geology conditions at the site corresponds to Santa Olaya Lava. The study revealed the presence of a silty clay and/or clayey silt, soft to stiff in consistency. Physiography of the region leads the presumption that locally, any groundwater discharges to the nearby creeks and streams in the area. The groundwater level in the area is about 30 to 40 feet deep. The permeability of the surrounding geologic materials is approximately  $10^{-5}$  to  $10^{-7}$  centimeters per second (cm/s).

**References: 38 through 43.**

- 3. What is the depth from the lowest point of waste disposal/storage to the highest seasonal level of the saturated zone of the aquifer of concern?**

The depth from the lowest point of waste disposal/storage to the highest seasonal level of the saturated zone of the aquifer of concern is estimated to be approximately 29 to 39 feet. This measurement is based upon the depth of the sample with contaminated surface soil (0-12 inches) and the depth to the aquifer (30 to 40 feet).

**References: 38 through 43, 61, 62, 63, and 64.**

- 4. What is the permeability value of the least permeable continuous intervening stratum between the ground surface and the top of the aquifer of concern?**

The permeability of the surrounding geologic materials is approximately  $10^{-5}$  to  $10^{-7}$  centimeters per second (cm/s).

**References: 43, 80, and 81.**

- 5. What is the net precipitation at the site (inches)?**

The net precipitation at the site is approximately 58.95 inches per year.

**References: 82 and 83.**

- 6. What is the distance to and depth of the nearest well that is currently used for drinking purposes?**

The distance to the nearest drinking water well is within a  $\frac{1}{4}$ - $\frac{1}{2}$  mile radius from the site. This well is mostly used for industrial purposes, but during drought seasons the employees from Caribe Paint, Corp. take home the water from the well and use it for personal purposes. In addition, there are three (3) additional private wells located within a  $\frac{1}{4}$  to 2-mile radius from the site. These wells are used to distribute bottled water around the island.

The depth of the nearest well used for drinking purposes is 315 feet, approximately.

Distance Miles	Well Name	Depth (feet)	Use
1/4 - 1/2	Caribe Paint	315	Industrial/Drinking
1/4 - 1/2	Aqua Fresh	706	Commercial
1/4 - 1/2	Le' Natural	545	Commercial
1 - 2	D' Light (a.k.a. Refresquería Cupey)	505	Commercial

References: 28, 29, 30, 34, 35, 36, and 37.

7. If a release to groundwater is observed or suspected, determine the number of people that obtain drinking water from wells that are documented or suspected to be actually contaminated by hazardous substance(s) attributed to an observed release from the site.

A release of contaminants to the groundwater is observed and documented through chemical analyses and confirmed through the MSDS documentation provided by The Clorox Company of PR; refer to Question No. 1 for a description of the likelihood of a release.

References: 51 through 67, and Figures: 2 and 2A.

Identify the population served by wells located within 4 miles of the site that draw from the aquifer of concern.

Distance	Population
On site	0
>0 - 1/4 mi	0
>1/4 - 1/2 mi	315*
>1/2 - 1 mi	0
>1 - 2 mi	0
>2 - 3 mi	2,464
>3 - 4 mi	7,251
<b>Total</b>	<b>10,030</b>

- \* The calculation of this number is as follows: 105 employees from Caribe Paint, Corp. take home the water from the onsite well for personal and drinking water purposes, multiplied by 3 persons/household (2.97 persons/household) according to the Puerto Rico Census for the year 2000; therefore, the population served by the nearest well is approximately 315 persons.

References: 37, and 40.

**State whether groundwater is blended with surface water, groundwater, or both before distribution.**

Groundwater is blended with surface water prior to its distribution to the population. There are three (3) groundwater wells connected to the Caguas Urbano (Caguas Sur) and Caguas Norte filter plants. These wells are located up gradient from the site.

**Reference: 33.**

**Is a designated wellhead protection area within 4 miles of the site?**

A Wellhead Protection Area (WHPA) is located within 4 miles of the site.

**References: 84 and 85.**

**Does a waste source overlie a designated or proposed wellhead protection area? If a release to groundwater is observed or suspected, does a designated or proposed wellhead protection area lie within the contaminant boundary of the release?**

Waste sources from the site (CCPR) overlie any designated Wellhead Protection Areas (WHPA). A release to groundwater is observed and documented through chemical (aqueous) analysis and the MSDS provided by the company; therefore, the WHPA lie within the boundary of the release.

**References: 63, 64, 84, and 85.**

**9. Identify one of the following resource uses of groundwater within 4 miles of the site (i.e., commercial livestock watering, ingredient in commercial food preparation, supply for commercial aquaculture, supply for major, or designated water recreation area, excluding drinking water use, irrigation (5-acre minimum) of commercial food or commercial forage crops, unusable).**

Available information indicates that groundwater is used for domestic and commercial purposes to distribute bottled drinking water around the island and to manufacture and distribute natural juices.

**References: 28, 29, and 30.**



## **SURFACE WATER ROUTE**

- 10. Describe the likelihood of a release of contaminant(s) to surface water as follows: observed release, suspected release, or none. Identify contaminants detected or suspected and provide a rationale for attributing them to the site. For observed release, define the supporting analytical evidence and relationship to background.**

A release of site-attributable contaminants to the surface water pathway is observed and documented by surface water sample analysis and confirmed through the MSDS documentation provided by The Clorox Company of PR. A total of six (6) sediment samples and seven (7) surface water samples were collected at the Cañas River, which is located within the target distance limit. Two (2) sediment (SD-05 and SD-06) and two (2) surface water (SW-06 and SW-07) samples were collected and used for background purposes since their locations are closer to the PPE's and are similar in environmental conditions. Manganese and acetone were found in surface water sample (SW-02) collected downstream from the site. Manganese was also detected in surface water sample SW-01 collected downstream from the site. Methylene chloride was found in the surface water samples (SW-02, SW-03, SW-04, and SD-05D) collected downstream and at the PPE's. Manganese and methylene chloride were detected in different sources identified inside the CCPR property or are the constituents of several substances used by this company, as documented by the MSDS provided. Aroclor-1260 was found in sediment sample (SD-04) collected at the PPE #2 (See Figures 2 and 5). The information specified in this paragraph documents an observed release to surface water. Downstream from the site there is the Cañas River (i.e. Río Cañas) at 0.19 miles, which converges into the Loíza River. The Loíza River converges (i.e. Río Grande de Loíza) into the Loíza Lake (a.k.a. Trujillo Alto Lake, Carraízo Lake), which is used for fishing and drinking water purposes.

**References: 1, 2, 11, 44 through 49, and Figure 5.**

- 11. Identify the nearest down slope surface water. If possible, include a description of possible surface drainage patterns from the site.**

The south side of the property has a gentle slope and a drainage ditch that discharge the storm waters from CCPR into the Cañas River. Río Cañas is a tributary of the Loíza River (i.e. Río Grande de Loíza), which is located 2.48 miles downstream from the site. The Loíza River converges into the Loíza Lake (a.k.a. Trujillo Alto Lake, Carraízo Lake), which is used for fishing and drinking water purposes. Loíza Lake is the major source of drinking water supply for the San Juan metropolitan area, providing waters to approximately 1,000,000 people. There is a significant potential for surface water runoff since the CCPR property slopes approximately 12 to 20 percent towards the Cañas River.

**References: 1, 2, 11, and 43 through 49.**

- 12. What is the distance in feet to the nearest down slope surface water? Measure the distance along a course that runoff can be expected to follow.**

The nearest down slope surface water body from the site is the Cañas River, located at a distance of approximately 1,003.2 feet (ft) or 0.19 miles.

**References: 1, 2, 11, and Figure 1.**

- 13. Identify all surface water body types within 15 downstream miles.**

Name	Water Body Type	Flow (cfs)	Saline/Fresh/Brackish
Cañas River (Río Cañas)	Small Stream	14.2	Fresh
Loíza River (Río Grande de Loíza)	Moderate to Large Stream	216	Fresh
Loíza Lake (a.k.a. Trujillo Alto Lake, Carraízo Lake)	Moderate to Large Stream	230.2*	Fresh
Loíza River (Río Grande de Loíza, below Carraízo Dam)	Moderate to Large Stream	266	Fresh

\* The flow for the Loíza Lake was obtained from the sum of the flows for Loíza River and Cañas River ( $14.2 + 216 = 230.2$  cubic feet per second or cfs).

**References: 1, 86, 87, and Figure 1.**

- 14. Determine the 2 yr, 24 hr rainfall (inches) for the site.**

The 2 yr, 24 hr rainfall for The Clorox Company of PR site is 4 inches.

**Reference: 88.**

- 15. Determine size of the drainage area (acres) for sources at the site.**

Drainage area for sources at The Clorox Company of PR is approximately 4.8 acres (19,425 m<sup>2</sup>). This area includes the flat areas of the property. Runoff from the site travel 0.19 miles southward into the Cañas River, 2.48 miles eastward into the Loíza River, and 3.1 miles northward into the Loíza Lake.

**References: 1, 2, 11, and 43.**

**16. Describe the predominant soil group in the drainage area.**

The predominant soil in the drainage area of concern is the Daguey clay, which is moderately steep and slopes are 100 to 500 feet long. The surface of the soil is a brown, firm clay and the subsoil is yellowish red and red firm clay. Permeability and the available water capacity are moderate. Due to the steep ness of the soil, the runoff is rapid and erosion is a hazard.

**Reference: 89.**

**17. Determine the type of floodplain that the site is located within.**

The Clorox Company of PR site is located within Flood Zone C, as designated by the Federal Emergency Management Agency (FEMA) insurance map 720000 0114B. The Zone C is described as an area of minimal flooding.

**Reference: 90.**

**18. Identify drinking water intakes in surface waters within 15 miles downstream of the point of surface water entry. For each intake identify: the name of the surface water body in which the intake is located, the distance in miles from the point of surface water entry, population served, and stream flow at the intake location.**

There is a surface water intake located at approximately 6.2 downstream miles from The Clorox Company of PR site. The population served by the Loíza Lake intake is approximately 1,000,000 persons. The stream flow at the intake is estimated at 230.2 cubic feet per second or cfs.

Intake	Distance (miles)	Flow (cfs)	Population Served
Loíza Lake	6.2	230.2*	1,000,000

\* The flow for the Loíza Lake was obtained from the sum of the flows for Loíza River and Cañas River ( $14.2 + 216 = 230.2$  cfs). Refer also to question #13.

**References: 1, 26,44, 46, 47, and Figure 1.**

19. Identify fisheries that exist within 15 miles downstream of the point of surface water entry. For each fishery specify the following information:

Fishery Name	Water Body Type	Flow (cfs)	Saline/Fresh/Brackish
Cañas River (Río Cañas)	Small Stream	14.2	Fresh
Loíza River (Río Grande de Loíza)	Moderate to Large Stream	216	Fresh
Loíza Lake (a.k.a. Trujillo Alto Lake, Carraizo Lake)	Moderate to Large Stream	230.2*	Fresh
Loíza River (Río Grande de Loíza, below Carraízo Dam, Carraízo Dam)	Moderate to Large Stream	266	Fresh

\* The flow for the Loíza Lake was obtained from the sum of the flows for Loíza River and Cañas River (14.2 + 216 = 230.2 cfs).

References: 44, 45, and Figure: 1.

20. Identify surface water sensitive environments that exist within 15 miles of the point of surface water entry.

Environment	Water Body Type	Flow (cfs)	Wetland Frontage
Loíza Lake (a.k.a. Trujillo Alto Lake, Carraizo Lake)	Moderate to Large Stream	230.2*	N/A

\* The flow for the Loíza Lake was obtained from the sum of the flows for Loíza River and Cañas River (14.2 + 216 = 230.2 cfs).

Two critical wildlife areas have been identified within a 4-mile radius from the site. These are the Trujillo Alto Lake and Lake Bairoa La 25. Trujillo Alto Lake supports a large variety of aquatic birds (Purple gallinule – *Porphyryula martinica*, Caribbean coot – *Fulica caribaea*, and the rare Least grebe – *Tachybaptus dominicus*. Lake Bairoa La 25 is a segment of Río Grande de Loíza that has been identified by the PR Department of Natural and Environmental Resources as an important support area for a great variety of wildlife such as: Black-crowned night heron – *Nycticorax nycticorax*, Great blue heron – *Ardea herodias*, Little blue heron – *Egretta caerulea*, Snowy egret – *E. thula*, Tricolored heron – *E. tricolor*, Puerto Rico Plain pigeon – *Patagioenas inornata*, West Indian tree duck – *Dendrocygna arborea*. The PR Plain pigeon - *Patagioenas inornata*, and the West Indian tree duck – *Dendrocygna arborea* are also considered federal and state endangered species.

Reference: 48 and 49.

- 21. If a release to surface water is observed or suspected, identify any intakes, fisheries, and sensitive environments from question Nos. 18-20 that are or may be actually contaminated by hazardous substance(s) attributed to an observed release of from the site.**

**Intake:** Loíza Lake

**Fishery:** Cañas River, Loíza Lake

**Sensitive Environment:** Loíza Lake

A release to surface water from the site is observed and documented. Surface water samples collected by PREQB Superfund PA/SI Division personnel from March 7-14, 2006 revealed high concentrations of manganese and methylene chloride that are attributable to the site. These contaminants were detected in different sources identified inside the CCPR property or are the constituents of several substances used by the company. There is an intake and several fisheries identified within the 15-miles target distance limit of the surface water pathway downstream from the site that may be actually impacted.

**References:** 44, 45, 46, 47, 48, 49, 61, 62, 63, 64, 86, and Figure: 1.

- 22. Identify whether the surface water is used for any of the following purposes, such as: irrigation (5 acre minimum) of commercial food or commercial forage crops, watering of commercial livestock, commercial food preparation, recreation, potential drinking water supply.**

Surface water within 15-miles downstream from the site is used for fishing and drinking water purposes.

**References:** 44, 45, 46, 47, and Figure: 1.

## SOIL EXPOSURE PATHWAY

**23. Determine the number of people that occupy residences or attend school or day care on or within 200 feet of observed contamination.**

There are thirteen (13) residences located at 200 feet or less from the CCPR property and at least four (4) of these residences are located contiguous to the site. The number of people that occupy residences on or within 200 feet of observed contamination are 39 persons. The calculation of this number is as follows: 13 residences multiplied by 3 persons/family (2.97 persons/family) according to the Puerto Rico Census for the year 2000 are 39 persons.

**References: 2 and 3.**

**24. Determine the number of people that regularly work on or within 200 feet of observed contamination.**

There are approximately 70 regular workers on or within the area of observed contamination. Toluene and 2-butanone were detected at the **surface soil** samples collected at the nearest residences that are located at 200 feet or less from the site. Toluene was not detected in the onsite samples collected, but it is a component of the hydrocarbon solvent that is included in the Material Safety Data Sheets (MSDS) provided by CCPR.

**Reference: 4.**

**25. Identify terrestrial sensitive environments on or within 200 feet of observed contamination.**

There are no terrestrial sensitive environments known to be located on or within 200 feet of the site.

**References: 1, 2, and Figure 1.**

**26. Identify whether there are any of the following resource uses, such as commercial agriculture, silviculture, livestock production or grazing within an area of observed or suspected soil contamination.**

There is no resource use of the soil on or within 200 feet of the site.

**References: 61 through 65; and Figures: 2 and 2A.**

**AIR PATHWAY**

- 27. Describe the likelihood of release of hazardous substances to air as follows: observed release, suspected release, or none. Identify contaminants detected or suspected and provide a rationale for attributing them the site. For observed release, define the supporting analytical evidence and relationship to background.**

A complaint dated April 3, 2000 specified about a release of bleach (Clorox) fumes to the air which, occurred in the year 1986, and a fire that occurred at the property of CCPR on March 25, 2000. The fire occurred in the warehouse used by CCPR to store empty bottles and boxes. During the sampling activities performed by PREQB Superfund PA/SI on March 7-14, 2006 no air samples were collected; however, air monitoring was performed and the following readings were detected when using a toxic vapor analyzer (TVA).

Sample Point	PID (ppm)	FID (ppm)
SS-01 (Background)	TVA NOT USED DUE TO WEATHER CONDITIONS	
SS-02 (Background)		
SS-03		
SS-04		
SS-05		
SS-06		
SS-07	0.40	3.41
SS-08	1.40	4.16
SS-09	1.77	2.83
SS-10D	1.77	2.83
SS-11	0.48	2.62
SS-12	1.38	3.07
SS-13	0.94	3.0
SS-14	0.70	0.29

ppm – parts per million

Sample Point	PID (ppm)	FID (ppm)
SD-01	2.67	7.03
SD-02	2.19	6.62
SD-03	1.92	6.40
SD-04	1.88	6.62
SD-05 (Background)	8.10	6.41
SD-06 (Background)	4.06	6.70
SD-07	TVA NOT USED DUE TO WEATHER CONDITIONS	

Sample Point	PID (ppm)	FID (ppm)
SW-01	3.18	7.29
SW-02	3.31	7.12
SW-03	1.92	6.40
SW-04	1.87	6.61
SW-05	1.87	6.61
SW-06 (Background)	8.10	6.41
SW-07 (Background)	4.06	6.70

Sample Point	PID (ppm)	FID (ppm)
GW-01	1.30	7.48
GW-02	1.16	6.96
GW-03 (Background)	0.51	6.50
GW-04 (Background)	2.93	0.76
GW-05	- 1.56	- 66
GW-06	- 0.14	- 0.93
GW-07	0.90	7.70
WW-01	- 0.01	- 0.48

ppm – parts per million

References: 17, 21, and 61.



**28. Determine populations that reside within 4 miles of the site.**

Distance	Population
On site	70
>0 - ¼ mi	531
>¼ - ½ mi	618
>½ - 1 mi	750
>1 - 2 mi	14,126
>2 - 3 mi	77,579
>3 - 4 mi	44,348
<b>Total</b>	<b>138,022</b>

Reference: 50.

**29. Identify sensitive environments, including wetlands and associated wetlands acreage, within 4 miles of the site.**

Distance	Wetlands Acreage	Sensitive Environments
0 - ¼ mi	None identified.	None identified
>¼ - ½ mi	None identified.	None identified
>½ - 1 mi	None identified.	None identified
>1 - 2 mi	None identified.	None identified
>2 - 3 mi	None identified.	Loíza Lake (a.k.a. Trujillo Alto Lake, Carraizo Lake)
>3 - 4 mi	20	Lake Bairoa La 25

Two (2) critical wildlife areas have been identified within a 4-mile radius from the site. These are the Trujillo Alto Lake and Lake Bairoa La 25. Trujillo Alto Lake supports a large variety of aquatic birds (Purple gallinule – *Porphyryla martinica*, Caribbean coot – *Fulica caribaea*, and the rare Least grebe – *Tachybaptus dominicus*. Lake Bairoa La 25 is a segment of Río Grande de Loíza that has been identified by the PR Department of Natural and Environmental Resources as an important support area for a great variety of wildlife such as: Black-crowned night heron – *Nycticorax nycticorax*, Great blue heron – *Ardea herodias*, Little blue heron – *Egretta caerulea*, Snowy egret – *E. thula*, Tricolored heron – *E. tricolor*, Puerto Rico Plain pigeon – *Patagioenas inornata*, West Indian tree duck –

*Dendrocygna arborea*. The PR Plain pigeon - *Patagioenas inornata*, and the West Indian tree duck - *Dendrocygna arborea* are also considered federal and state endangered species.

**References: 1, 48; Figure 1.**

- 30. If a release to air is observed or suspected, determine the number of people that reside or are suspected to reside within the area of air contamination from the release.**

There are thirteen (13) residences located at 200 feet or less from the site that resides within the area of air contamination from the release. The complaint dated April 3, 2000 specified about a release of Clorox to the air, occurred in the year 1986, and a fire occurred at the property of CCPR on March 25, 2000. The fire occurred in the warehouse used by CCPR to store the empty bottles and boxes.

**References: 2, 17, and 21.**

- 31. If a release to air is observed or suspected, identify any sensitive environments, listed in question No. 29 that are or may be located within the area of air contamination from the release.**

A complaint dated April 3, 2000 specified about a release of bleach (Clorox) fumes to the air which, occurred in the year 1986, and a fire that occurred at the property of CCPR on March 25, 2000. The fire occurred in the warehouse used by CCPR to store empty bottles and boxes. Two critical wildlife areas have been identified within a 4-mile radius from the site. These are the Trujillo Alto Lake and Lake Bairoa La 25. Trujillo Alto Lake supports a large variety of aquatic birds (Purple gallinule - *Porphyryula martinica*, Caribbean coot - *Fulica caribaea*, and the rare Least grebe - *Tachybaptus dominicus*. Lake Bairoa La 25 is a segment of Río Grande de Loíza that has been identified by the PR Department of Natural and Environmental Resources as an important support area for a great variety of wildlife such as: Black-crowned night heron - *Nycticorax nycticorax*, Great blue heron - *Ardea herodias*, Little blue heron - *Egretta caerulea*, Snowy egret - *E. thula*, Tricolored heron - *E. tricolor*, Puerto Rico Plain pigeon - *Patagioenas inornata*, West Indian tree duck - *Dendrocygna arborea*. The PR Plain pigeon - *Patagioenas inornata*, and the West Indian tree duck - *Dendrocygna arborea* are also considered federal and state endangered species.

**References: 17, 21, and 48.**

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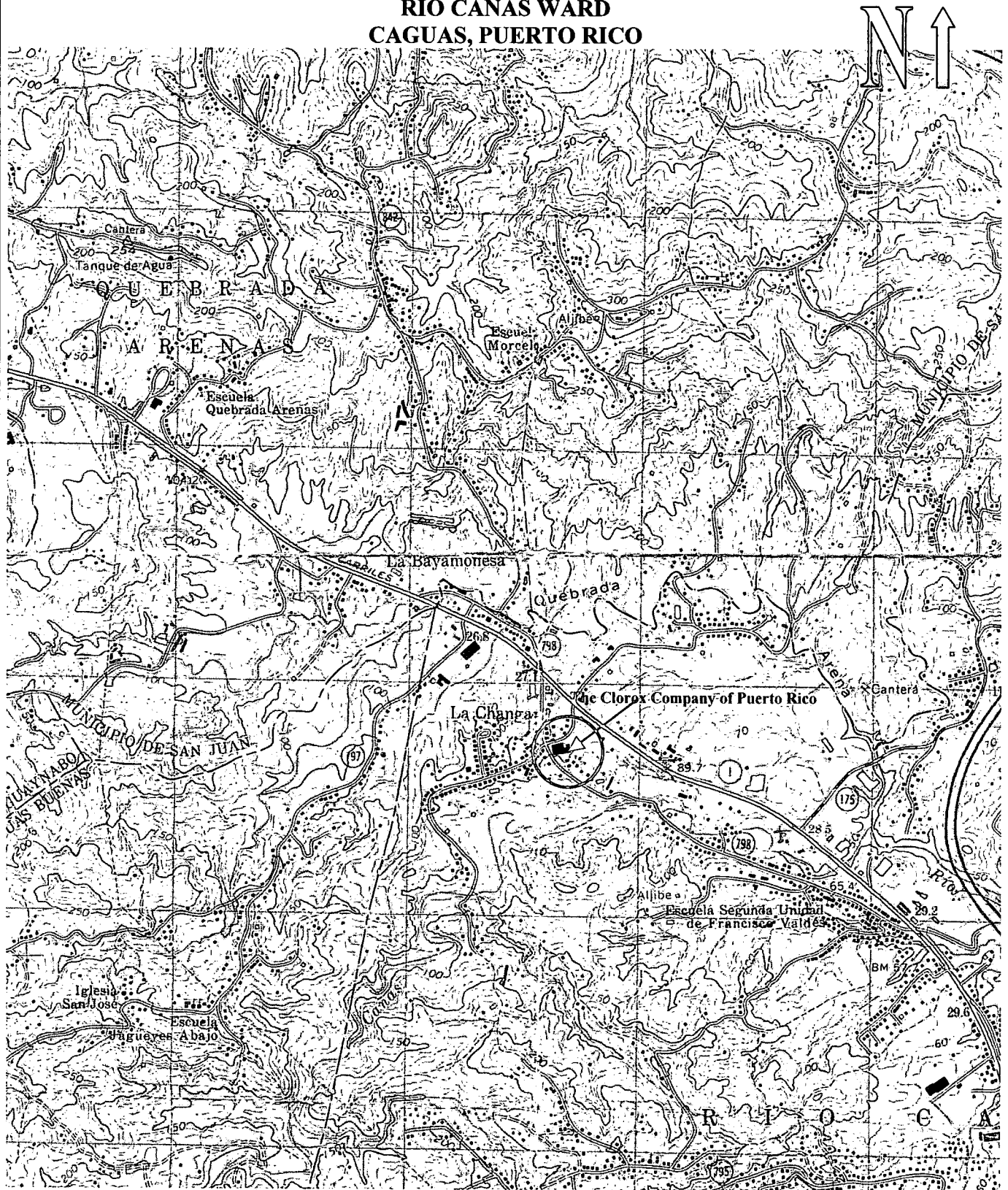
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# FIGURE 1

**SITE LOCATION MAP  
THE CLOROX COMPANY OF PUERTO RICO  
STATE ROAD #1 KM 27.1, RAMAL 798  
RÍO CAÑAS WARD  
CAGUAS, PUERTO RICO**



**NOT TO SCALE**

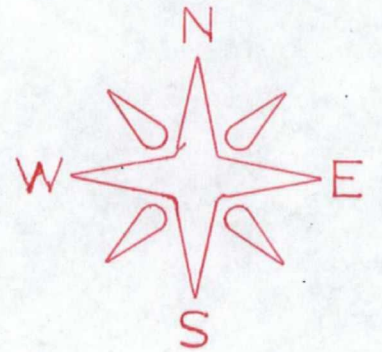
**FIGURE 1**

A vertical dashed line runs along the left edge of the page, consisting of a series of short, thick black horizontal bars.

# **FIGURE 2**



SITE SKETCH  
THE CLOROX COMPANY OF PUERTO RICO  
STATE ROAD #1 KM 27.1 RAMAL 798  
RIO CAÑAS WARD  
CAGUAS, PUERTO RICO



NOT TO SCALE

FIGURE 2

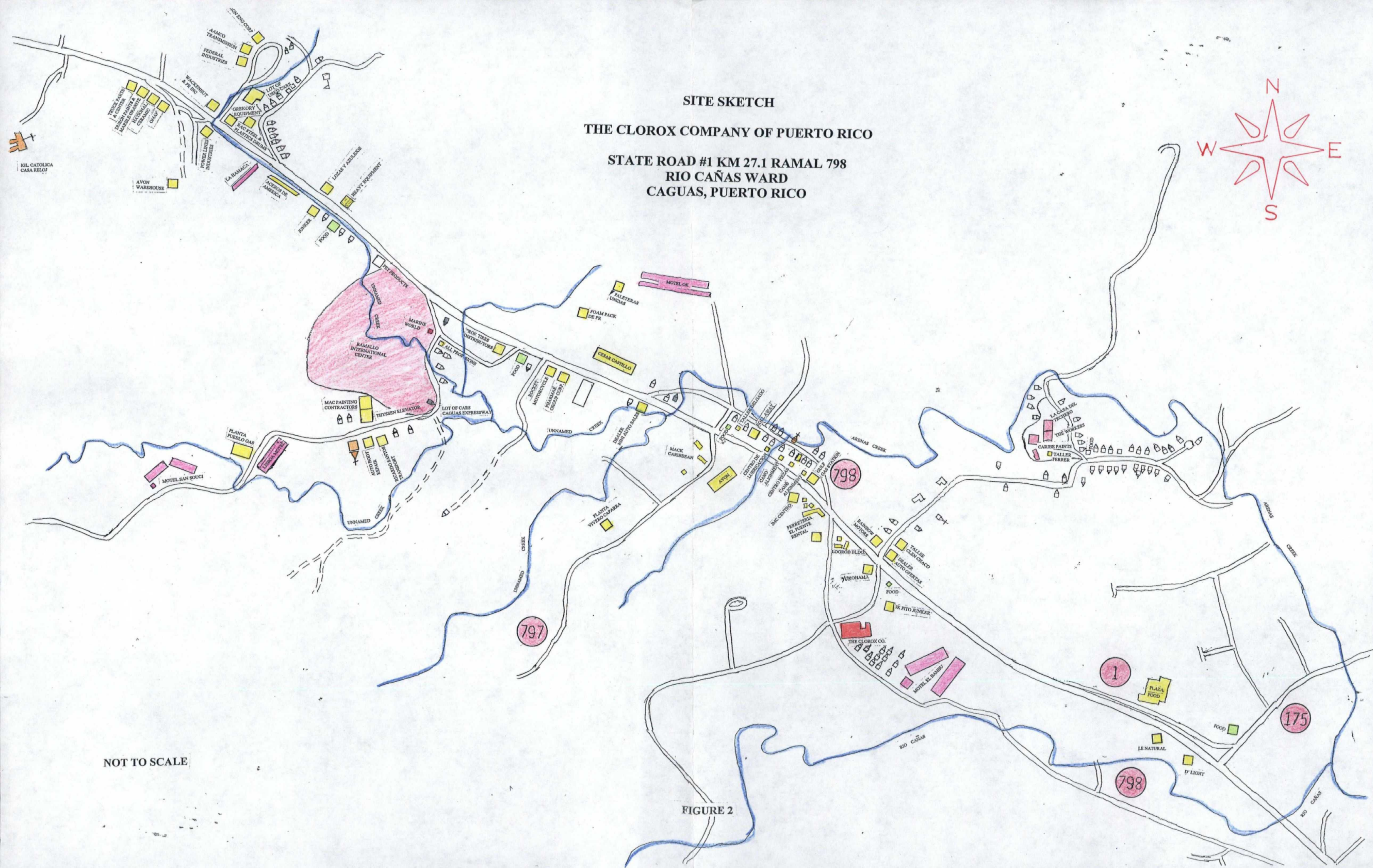






Figure 2-A

The Clorox Company of PR  
State Road #1 KM 27.1, Ramal 798  
Río Cañas Ward Caguas P.R.

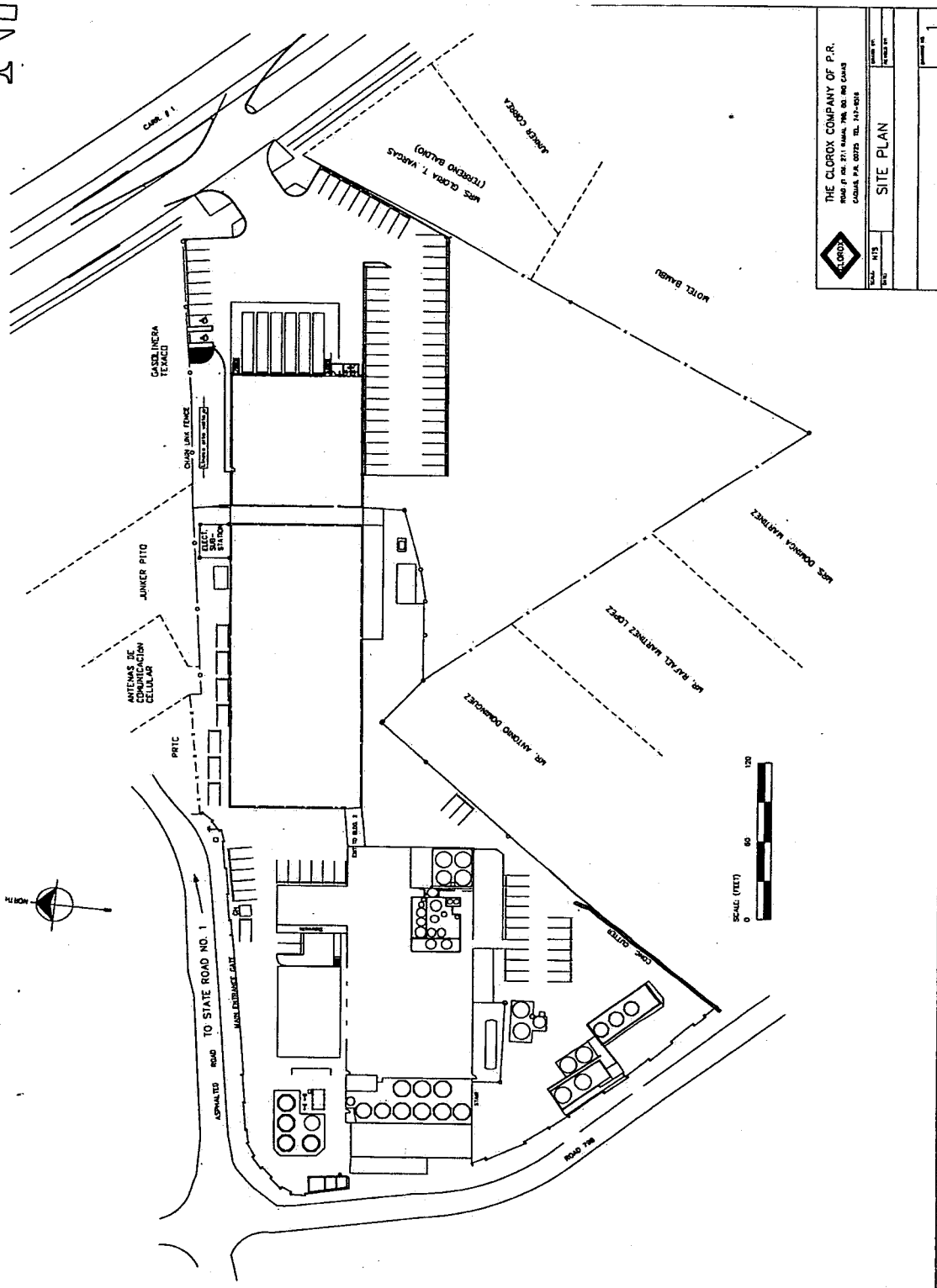
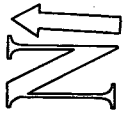
0 25 50 100 Meters





# FIGURE 3

**SITE SKETCH**  
**THE CLOROX COMPANY OF PUERTO RICO**  
**STATE ROAD #1 KM 27.1, RAMAL 798**  
**RÍO CAÑAS WARD**  
**CAGUAS, PUERTO RICO**



		<b>THE CLOROX COMPANY OF P.R.</b> ROAD #1 KM 27.1 RAMAL 798, RIO CAÑAS CAGUAS, P.R. 00725 TEL. 747-5034	
		<b>SITE PLAN</b>	
SCALE	DATE	BY	FOR
1:100	11/75		

**FIGURE 3**

**(NOT TO SCALE)**



A vertical dashed line consisting of 20 short, thick black horizontal bars spaced evenly along the left edge of the page.

# FIGURE 4





# Legend

- |  |                   |  |               |  |             |
|--|-------------------|--|---------------|--|-------------|
|  | Facility Entrance |  | Sediment      |  | Waterbodies |
|  | Onsite Cistern    |  | Surface Soil  |  | Highway     |
|  | Groundwater Wells |  | Surface Water |  | Primary     |
|  | Onsite Water Well |  | Waste Water   |  | Secondary   |
|  | Perimeter         |  |               |  | tertiary    |



Oficina de Sistema  
Información Geográfica

Figure 4

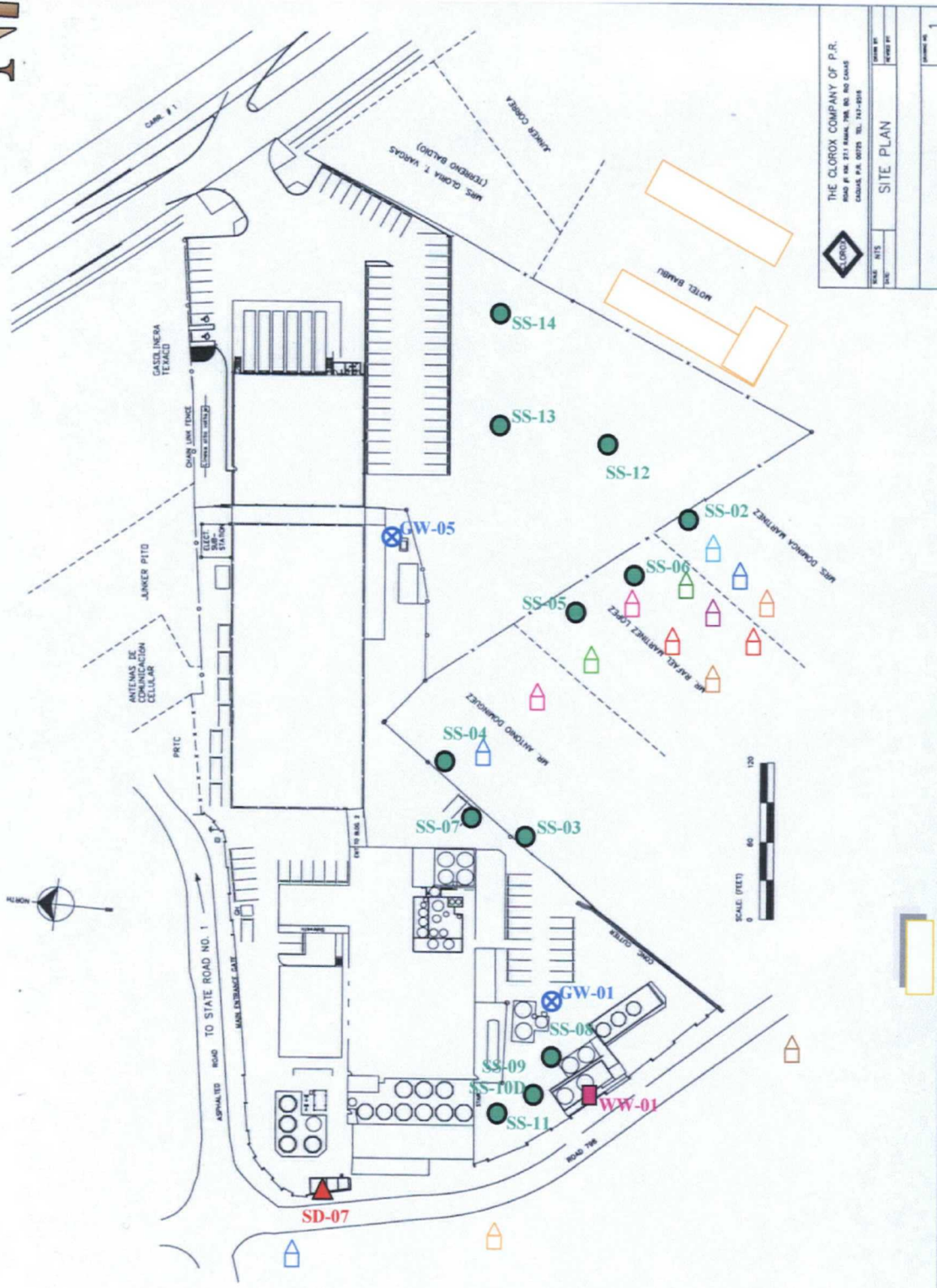
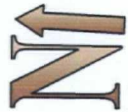
Sample Points Location Map  
The Clorox Company of Puerto Rico  
State Road #1 KM 27.1 Ramal 798  
Río Cañas Ward  
Caguas, Puerto Rico



0 10 20 40 Meters



**SOIL & GROUNDWATER SAMPLING POINTS  
LOCATION MAP  
THE CLOROX COMPANY OF PUERTO RICO  
STATE ROAD #1 KM 27.1, RAMAL 798  
RÍO CAÑAS WARD  
CAGUAS, PUERTO RICO**



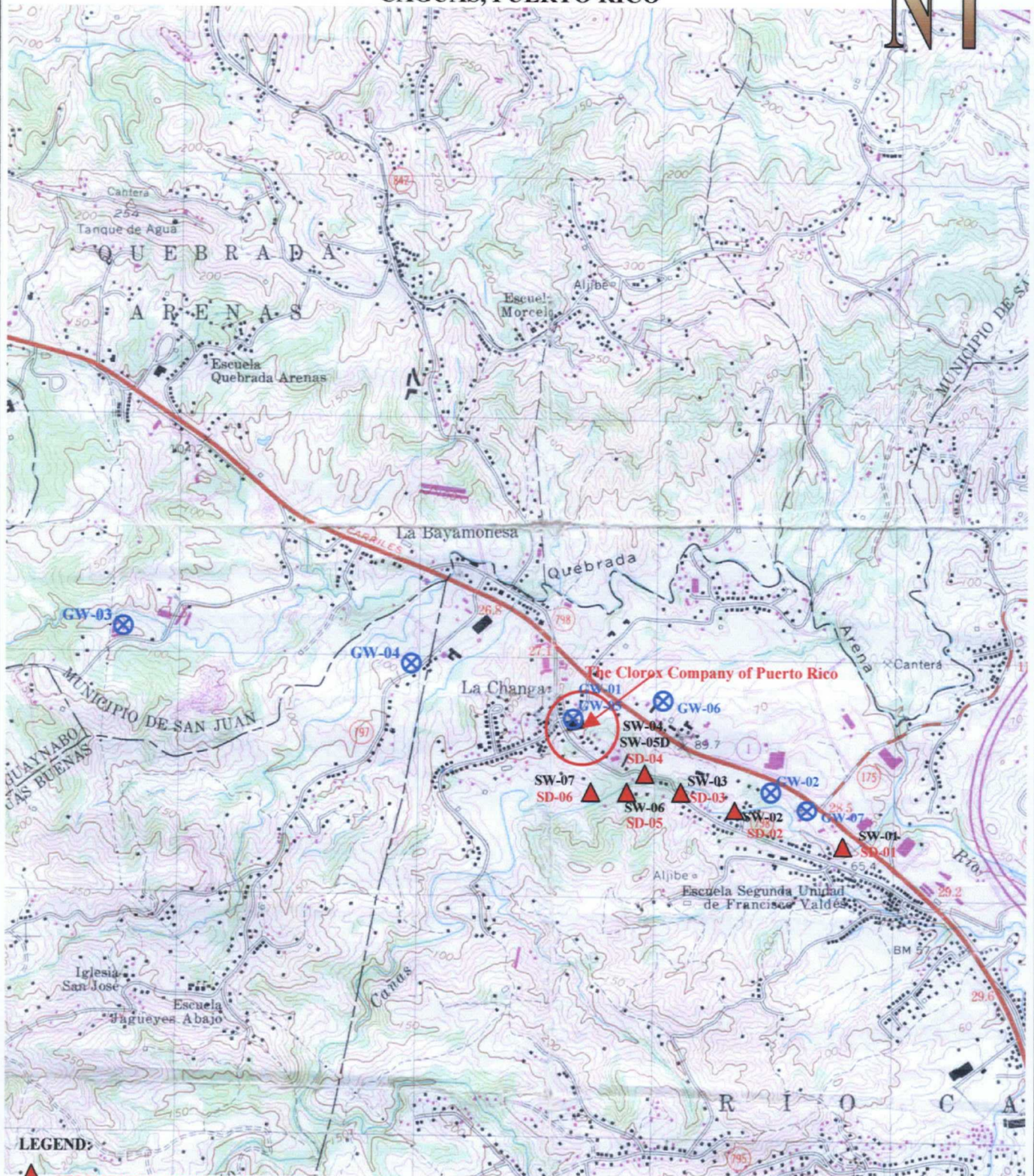
**FIGURE 4A**

**(NOT TO SCALE)**

# FIGURE 5



**SAMPLE POINTS LOCATION MAP (CONT'N.)  
THE CLOROX COMPANY OF PUERTO RICO  
STATE ROAD #1 KM 27.1, RAMAL 798  
RÍO CAÑAS WARD  
CAGUAS, PUERTO RICO**








**NOT TO SCALE**

**FIGURE 5**






**Legend**

-  Facility Entrance
-  Surface Water
-  Sediment
-  Command Post
-  Groundwater Wells

**Surface Soil sampling**

 cc-ss-01




Oficina de Sistema  
Información Geográfica

**Sample Points Location Map (Cont'n.)**  
**The Clorox Company of Puerto Rico**  
**State Road #1 KM 27.1 Ramal 798**  
**Río Cañas Ward**  
**Caguas, Puerto Rico**

Figure 5 A



0 155 310 620 Meters





A vertical dashed line consisting of 20 short, thick black horizontal bars spaced evenly along the left edge of the page.

# **ATTACHMENT 1**

**OFF SITE/ON SITE RECONNAISSANCE  
INFORMATION REPORTING FORM**

**Date:** March 7-14, 2006

**Site Name:** The Clorox Company of PR

**Camera:** Canon Sureshot T-50/Minolta Weather Matic

**Film:** 35mm Kodak Gold

**Photographer:** Nereida Hernández Morales

**P H O T O L O G**

PHOTO/NUMBER	DATE/TIME	DESCRIPTION
1	03/07/2006 0745 hours	CC-SS-01. Soil (background) sample collected at the "Iglesia Pentecostal Manantial de Vida" at areas outside the facility and presumed to be out of the influence of site activities and contamination; depth 0 - 12".
2 - 3	03/07/2006 0757 hours	CC-SS-02. Soil (background) sample collected at the backyard of Ms. Carmen Martínez's residence at areas outside the facility and presumed to be out of the influence of site activities and contamination; depth 0 - 12".
4 - 5	03/07/2006 1212 hours	CC-SS-03. Soil sample collected on the north side of the property of Mr. César Domínguez where some stressed vegetation was observed during the sampling activities. This property (nearest) is located on the south side of the property of The Clorox Company of P.R.; sample taken to determine migration of contaminants from the site; depth 0 - 12".



6 - 7	03/07/2006 1127 hours	CC-SS-04. Soil sample collected on the north side of the property of Mr. César Domínguez, just across the fence with The Clorox Company of P.R. where many empty metal and plastic drums of 55-gallons each, several unlabeled drums, and one drum labeled as oil with diesel (open on one side of the lid), were observed in this area during the visual inspection performed on October 25, 2005. Mr. Domínguez's residence is located on the south side of the property of The Clorox Company of P.R.; sample taken to determine migration of contaminants from the site; depth 0 - 12".
8 - 9	03/07/2006 0957 hours	CC-SS-05. Soil sample collected at the backyard of Ms. Blanca Martínez's residence that is located on the south side of the property of The Clorox Company of P.R.; to determine migration of contaminants from the site; depth 0 - 12".
10 - 11	03/07/2006 0926 hours	CC-SS-06 Soil sample to be collected at the backyard of Mr. Eliseo Nuñez's residence that is located on the south side of the property of The Clorox Company of P.R.; to determine migration of contaminants from the site; depth 0 - 12".
12 - 13	03/09/2006 0938 hours	CC-SS-07. Soil sample collected onsite behind the warehouse storage building located on the south side of The Clorox Company of Puerto Rico. Many empty metal and plastic drums of 55-gallons each, several unlabeled drums, and one drum labeled as oil with diesel (open on one side of the lid), were observed in this area during the visual inspection performed on October 25, 2005. Sample collected to determine type and concentration of contaminants; depth 0 - 12".
14 - 15	03/09/2006 1216 hours	CC-SS-08. Soil sample collected onsite behind the building located on the southwest side of The Clorox Company of Puerto Rico, at the slope that descends towards the tanks used to store the effluents; to determine type and concentration of contaminants; and the Matrix Spike/Matrix Spike Duplicate for quality control purposes; depth 0 - 12".

16 – 17	03/09/2006 1333 hours	CC-SS-09. Soil sample and its duplicate collected onsite behind the building located on the southwest side of The Clorox Company of Puerto Rico, next to the PVC tube observed during the visual inspection performed on October 25, 2005. The PVC tube is used to discharge the effluents from the manufacturing process into the retention tanks located on the southwest side of the property. Sample collected to determine type and concentration of contaminants; depth 0 - 12".
18 – 19	03/09/2006 1345 hours	CC-SS-10. Duplicate of CC-SS-09. Soil sample collected onsite behind the building located on the southwest side of The Clorox Company of Puerto Rico, between the cooling towers observed during the visual inspection performed on October 25, 2005; to determine type and concentration of contaminants; depth 0 - 12".
20 – 21	03/09/2006 1442 hours	CC-SS-11. Soil sample collected onsite behind the building located on the southwest side of The Clorox Company of Puerto Rico, between the cooling towers observed during the visual inspection performed on October 25, 2005; to determine type and concentration of contaminants; depth 0 - 12".
22	03/09/2006 0818 hours	CC-SS-12. Soil sample collected onsite behind the building located on the southeast side of The Clorox Company of Puerto Rico at the area used to irrigate with the waters from the underground injection well; to determine type and concentration of contaminants; depth 0 - 12".
23 – 24	03/09/2006 0846 hours	CC-SS-13. Soil sample collected onsite behind the building located on the southeast side of The Clorox Company of Puerto Rico at the area used to irrigate with the waters from the underground injection well; to determine type and concentration of contaminants; depth 0 - 12".
25 – 26	03/09/2006 0943 hours	CC-SS-14. Soil sample collected onsite behind the building located on the southeast side of The Clorox Company of Puerto Rico at the area used to irrigate with the waters from the underground injection well; to determine type and concentration of contaminants; depth 0 - 12".

27 - 28	03/13/2006 0735 hour	CC-SD-01. Sediment sample collected at the Cañas River, at approximately 0.5 downstream miles from the probable point of entry #1, to determine migration of contaminants from the site to the surface water; depth 0 - 12".
29 - 30	03/13/2006 0929 hours	CC-SD-02. Sediment sample collected at the Cañas River, at approximately 0.16 downstream miles from the probable point of entry #1, to determine migration of contaminants from the site to the surface water; depth 0 - 12".
31 - 32	03/13/2006 1116 hours	CC-SD-03. Sediment sample collected at the probable point of entry #1 at the Cañas River, to determine migration of contaminants from the site to the surface water; depth 0 - 12".
33 - 34	03/14/2006 0730 hours	CC-SD-04. Sediment sample collected at the probable point of entry #2 at the Cañas River, to determine migration of contaminants from the site to the surface water; depth 0 - 12".
35 - 36	03/14/2006 0928 hours	CC-SD-05. Sediment background sample (Cañas River) collected at approximately 75 feet upstream from the probable point of entry #2 at areas presumed to be out of the influence of site activities and contamination; depth 0 - 12".
37 - 38	03/14/2006 1135 hours	CC-SD-06. Sediment (background) sample collected at the Cañas River at approximately 150 feet upstream from the probable point of entry #2 at areas presumed to be out of the influence of site activities and contamination; depth 0 - 12".
39 - 40	03/07/2006 0714 hours	CC-SD-07. Sediment sample collected from one of the drums located on the northwest side of the property and used to store the sludge from the manufacturing process.
41 - 42	03/10/2006 1025 hours	CC-GW-01. Groundwater sample collected at the onsite well (west well) located on the west side of the property of The Clorox Company of Puerto Rico. Well depth is at 540 feet.

43 - 44	03/10/2006 0856 hours	CC-GW-02. Groundwater sample collected down gradient at Le' Natural, located to the southeast within ¼ - ½ mile radius from the site to determine migration of contaminants from the site to the groundwater pathway. Well depth is approximately 545 feet.
45	03/10/2006 1228 hours	CC-GW-03. Groundwater sample collected up gradient at the Sans Souci Motel, located to the west within ½ - 1 mile radius from the site for background purposes. Well depth is unknown.
46 - 47	03/08/2006 0740 hours	CC-GW-04. Groundwater up gradient at the "Plantas de Caparra Vivero", located to the west within ¼ - ½ mile radius from the site for background purposes. Well depth is at 565 feet.
48 - 49	03/08/2006 0955 hours	CC-GW-05. Groundwater sample collected at the onsite well (east well) located on the east side of the property of The Clorox Company of Puerto Rico, and the Matrix Spike/Matrix Duplicate for quality control purposes. Well depth is at 600 feet.
50 - 51	03/08/2006 1142 hours	CC-GW-06. Groundwater collected down gradient at Aqua Fresh Spring Water Corp. (a.k.a. Agua Fresca de P.R.), located to the northeast, within ¼ - ½ mile radius from the site to determine migration of contaminants from the site to the groundwater pathway. Well depth is at 706 feet.
52 - 53	03/10/2006 0740 hours	CC-GW-07. Groundwater collected down gradient at D'Light (well #1), located to the east within 1 - 2 mile radius from the site to determine migration of contaminants from the site to the groundwater pathway. Well depth is at 505 feet.
54	03/08/2006 1311 hours	CC-WW-01. Waste water sample collected onsite from the tanks used by The Clorox Company of Puerto Rico to store the effluents coming from the manufacturing process.
55 - 56	03/13/2006 0714 hours	CC-SW-01. Surface water sample collected at the Cañas River, at approximately 0.5 downstream miles from the probable point of entry #1, to determine migration of contaminants from the site to the surface water pathway; depth 0 - 12".

57 - 58	03/13/2006 0907 hours	CC-SW-02. Surface water sample collected at the Cañas River, at approximately 0.16 downstream miles from the probable point of entry #1, to determine migration of contaminants from the site to the surface water pathway; depth 0 - 12".
59 - 60	03/13/2006 1051 hours	CC-SW-03. Surface water sample collected at the probable point of entry #1 at the Cañas River, to determine migration of contaminants from the site to the surface water pathway; depth 0 - 12".
61 - 62	03/14/2006 0702 hours	CC-SW-04. Surface water sample and its duplicate (SW-05) collected at the probable point of entry #2 at the Cañas River, to determine migration of contaminants from the site to the surface water pathway; depth 0 - 12".
63 - 64	03/14/2006 0708 hours	CC-SW-05. Duplicate, surface water sample collected at the probable point of entry #2 at the Cañas River, to determine migration of contaminants from the site to the surface water pathway; depth 0 - 12".
65 - 66	03/14/2006 0911 hours	CC-SW-06. Background, surface water sample collected at approximately 75 feet upstream from the probable point of entry #2. Sample collected at the Cañas River at areas presumed to be out of the influence of site activities and contamination; depth 0-12".
67 - 68	03/14/2006 1116 hours	CC-SW-06. Background, surface water sample collected at approximately 150 feet upstream from the probable point of entry #2. Sample collected at the Cañas River at areas presumed to be out of the influence of site activities and contamination; depth 0 - 12".
69	03/08/2006 1304 hours	Photo taken to the tanks that The Clorox Company of Puerto Rico uses to store the effluents coming from the manufacturing process.
70	03/08/2006 1234 hours	Photo taken to the PVC tube observed on the south side of the property, and next to the tanks that The Clorox Company of Puerto Rico uses to store the effluents coming from the manufacturing process.

71

03/10/2006  
1052 hours

Photo taken to the bottles of the split samples collected for The Clorox Company of PR that Mr. Enrique Sáánchez from Caribe Environmental Services (the company that The Clorox Company of PR contracted to receive the split samples) placed on the floor without any plastic liner.

72

03/10/2006  
1057 hours

Photo taken of Mr. Enrique Sánchez when he opened the vials of the field trip blanks for sample point GW-01.

**Note: The photo number in this reporting form does not correspond to the photo log sequence in the inspection logbook.**



PHOTO 1



PHOTO 2





PHOTO 3



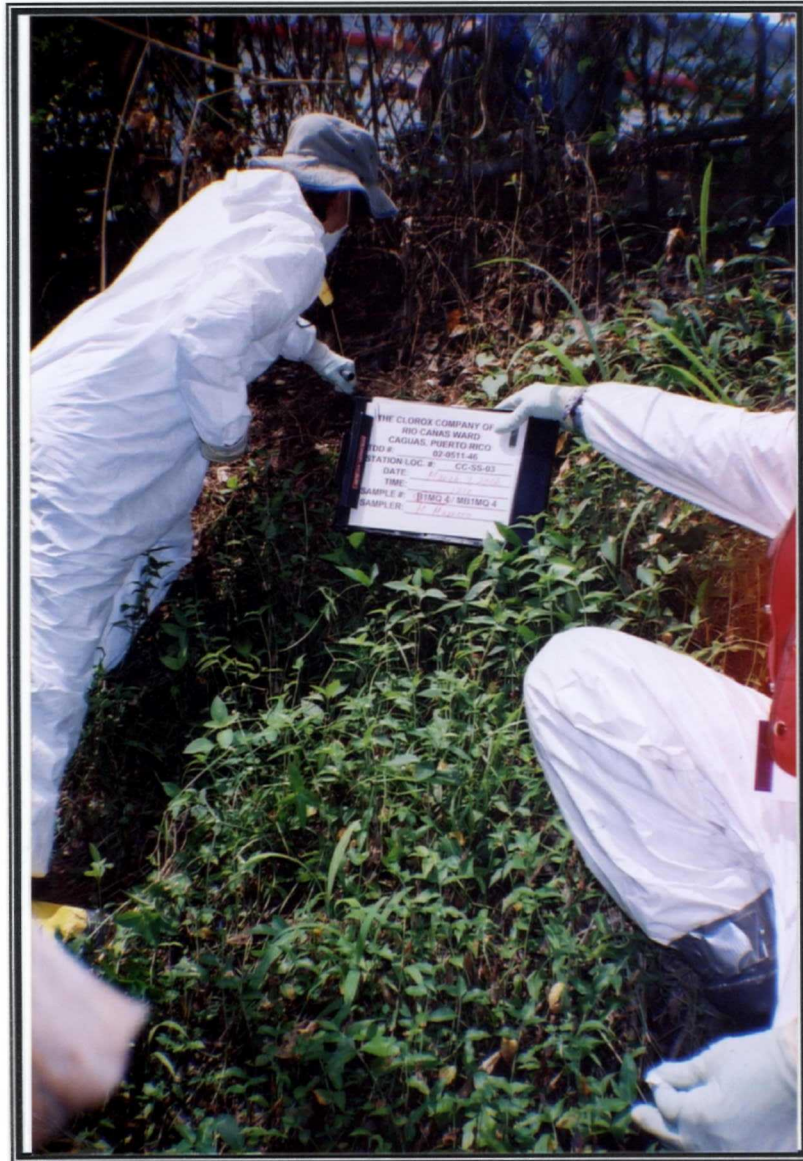


PHOTO 4

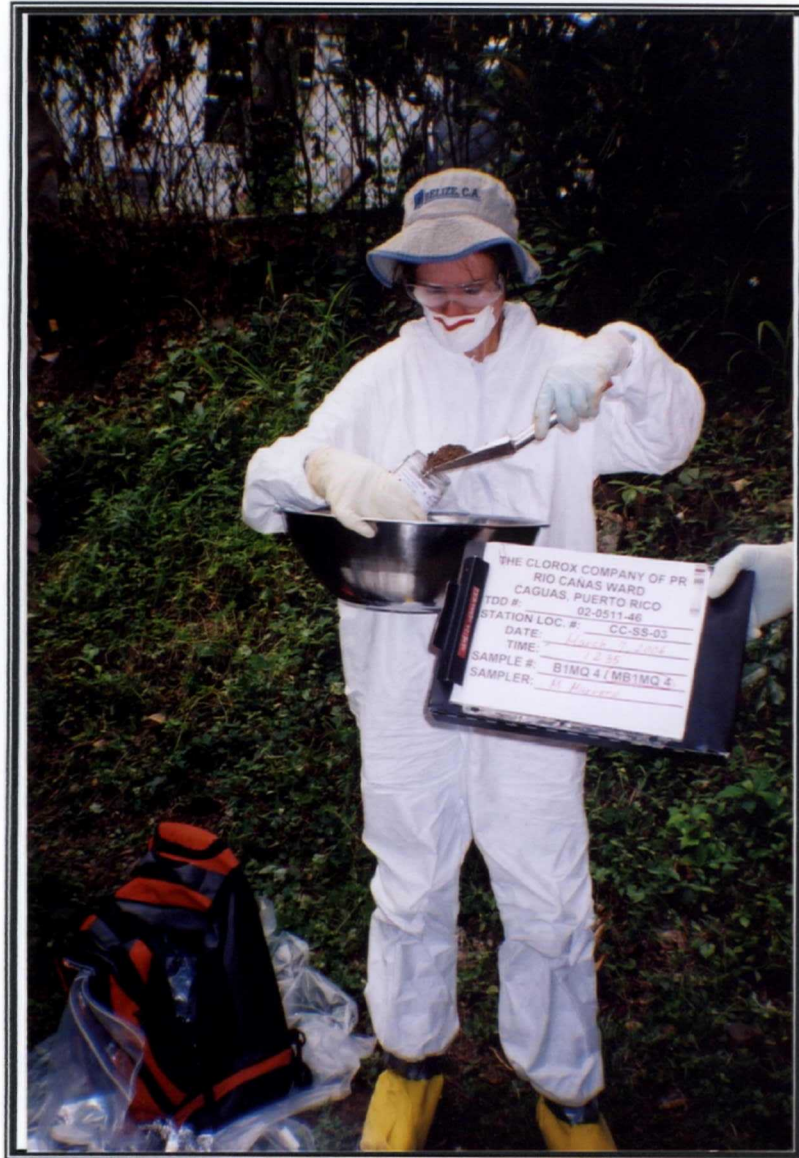


PHOTO 5



PHOTO 6





PHOTO 7



PHOTO 8



PHOTO 9





PHOTO 10



PHOTO 11



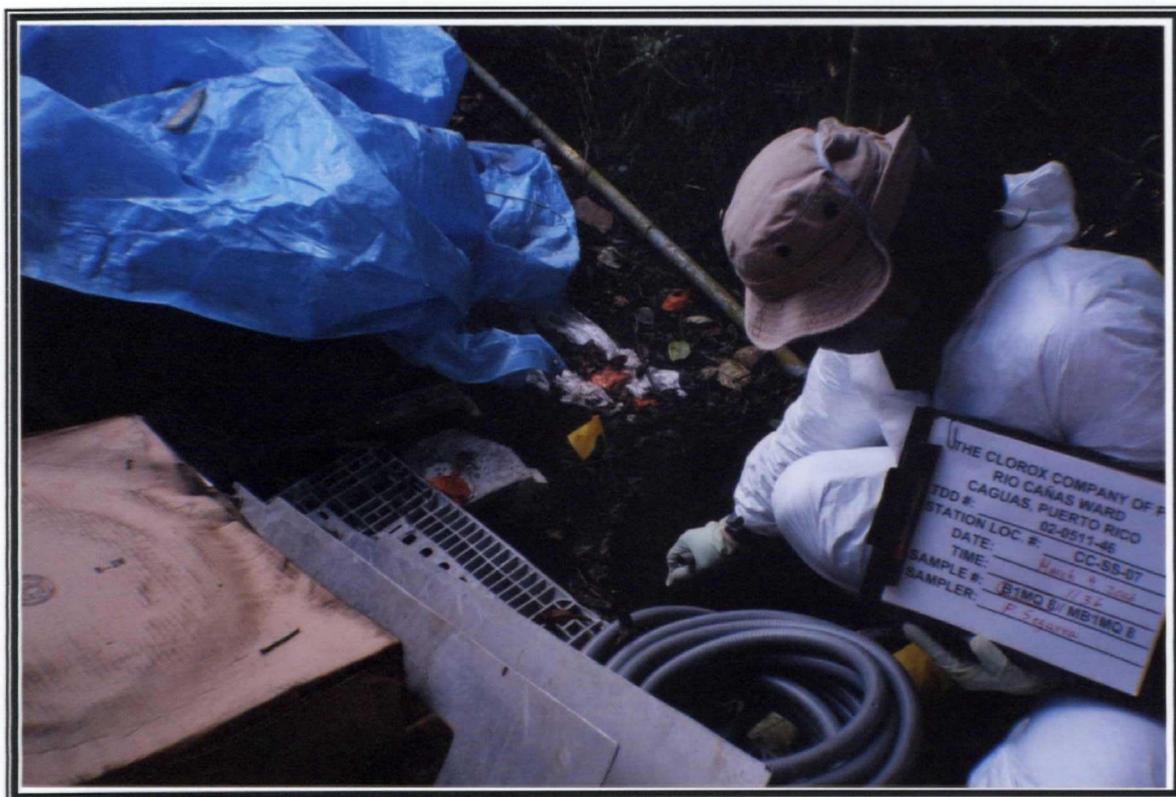


PHOTO 12



PHOTO 13





PHOTO 16



PHOTO 17





PHOTO 14



PHOTO 15



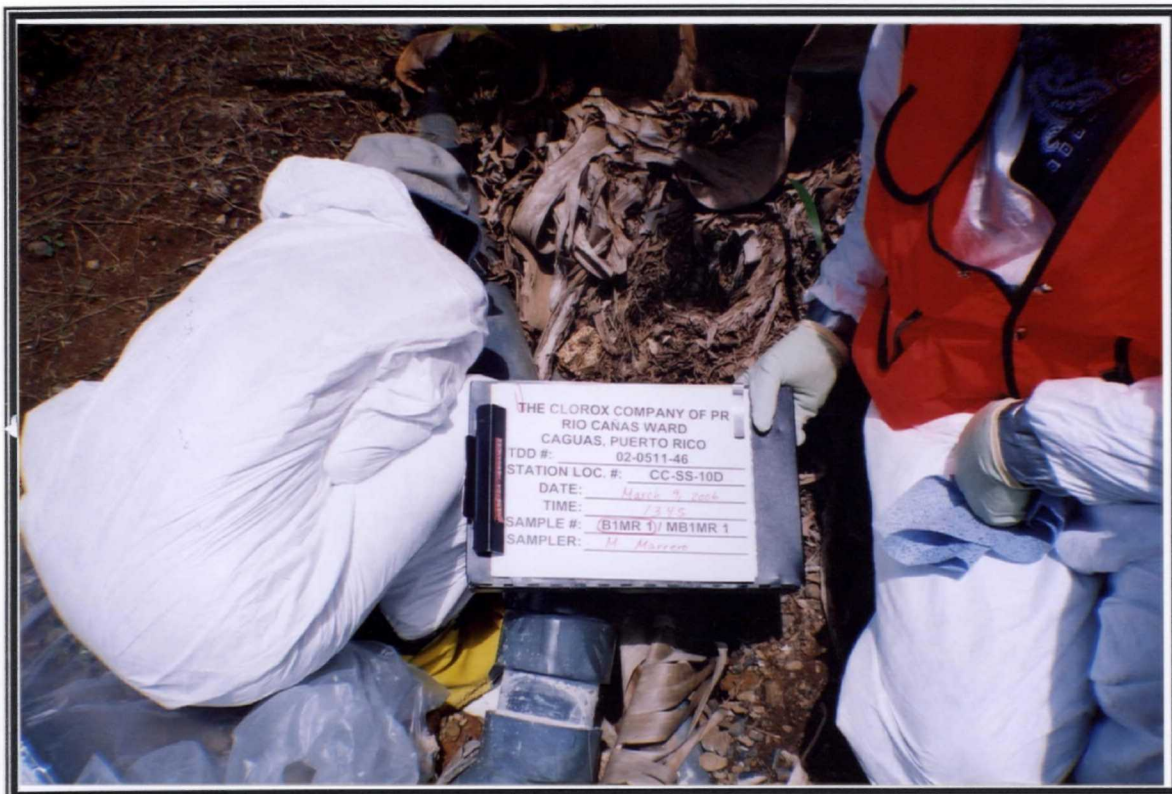


PHOTO 18



PHOTO 19





PHOTO 20



PHOTO 21





PHOTO 22



PHOTO 23





PHOTO 24

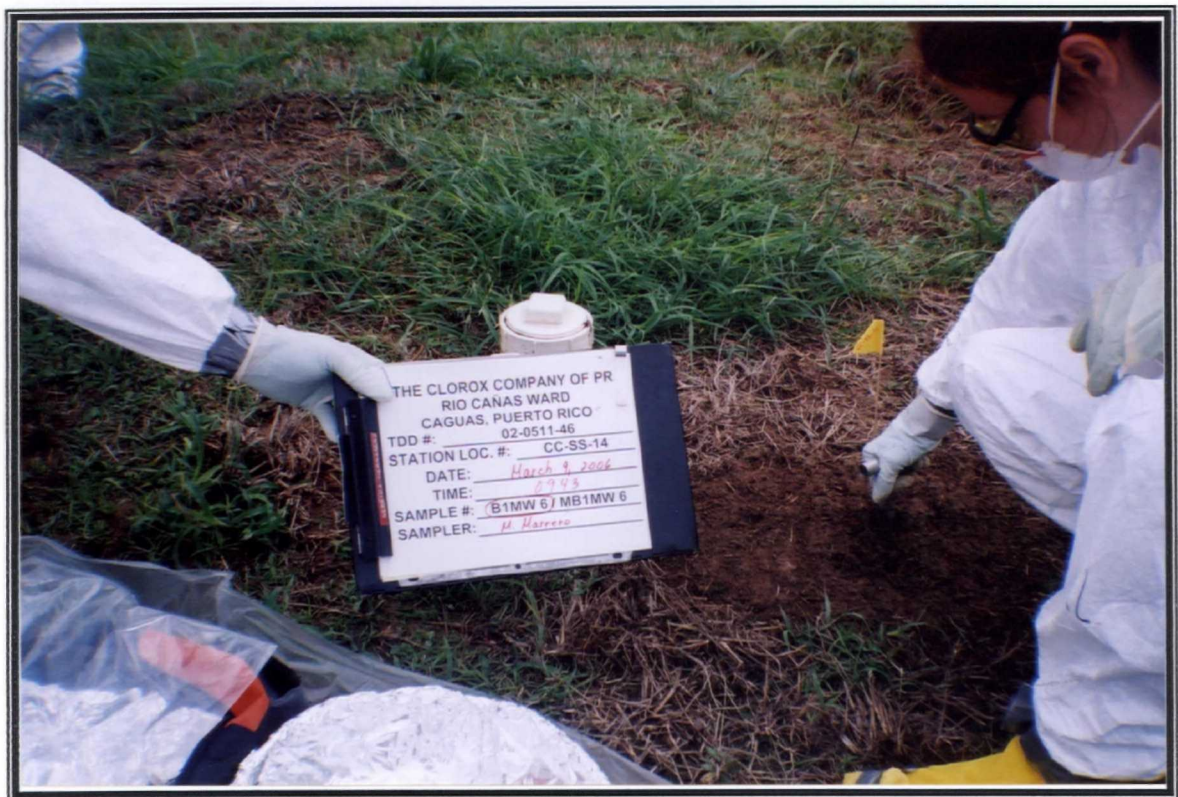


PHOTO 25



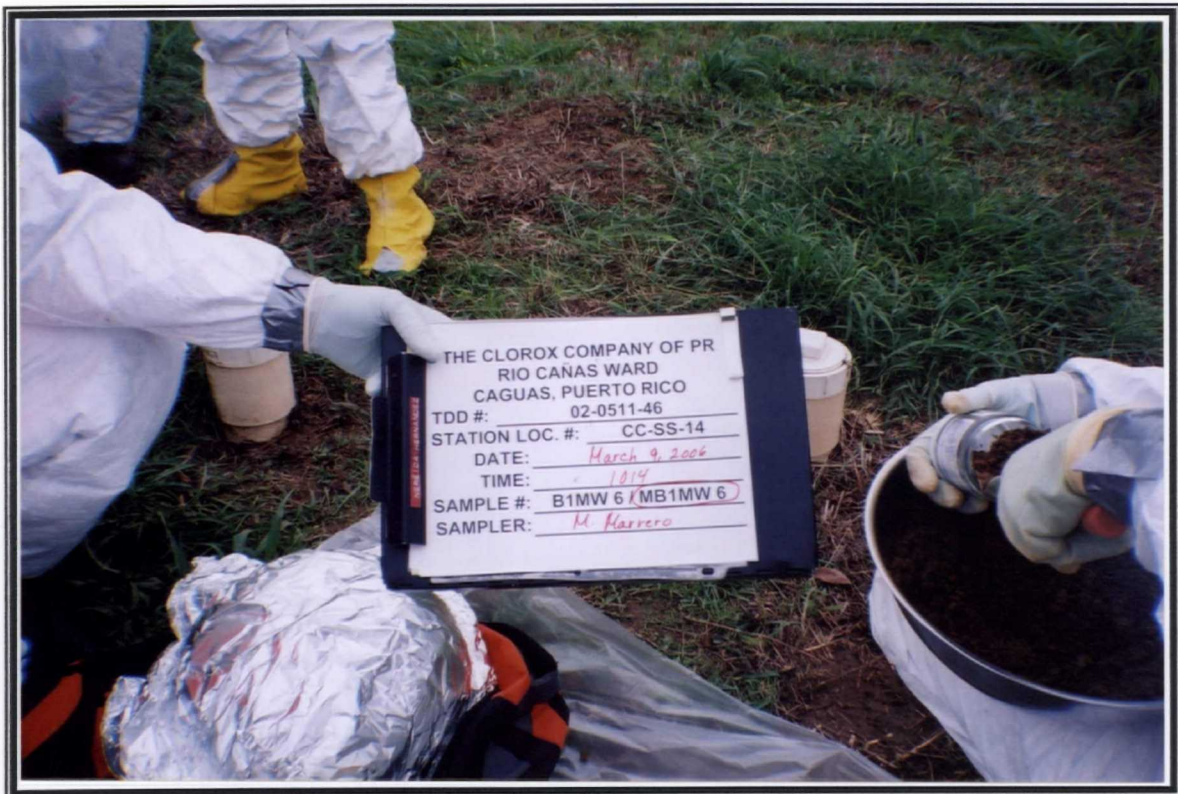


PHOTO 26

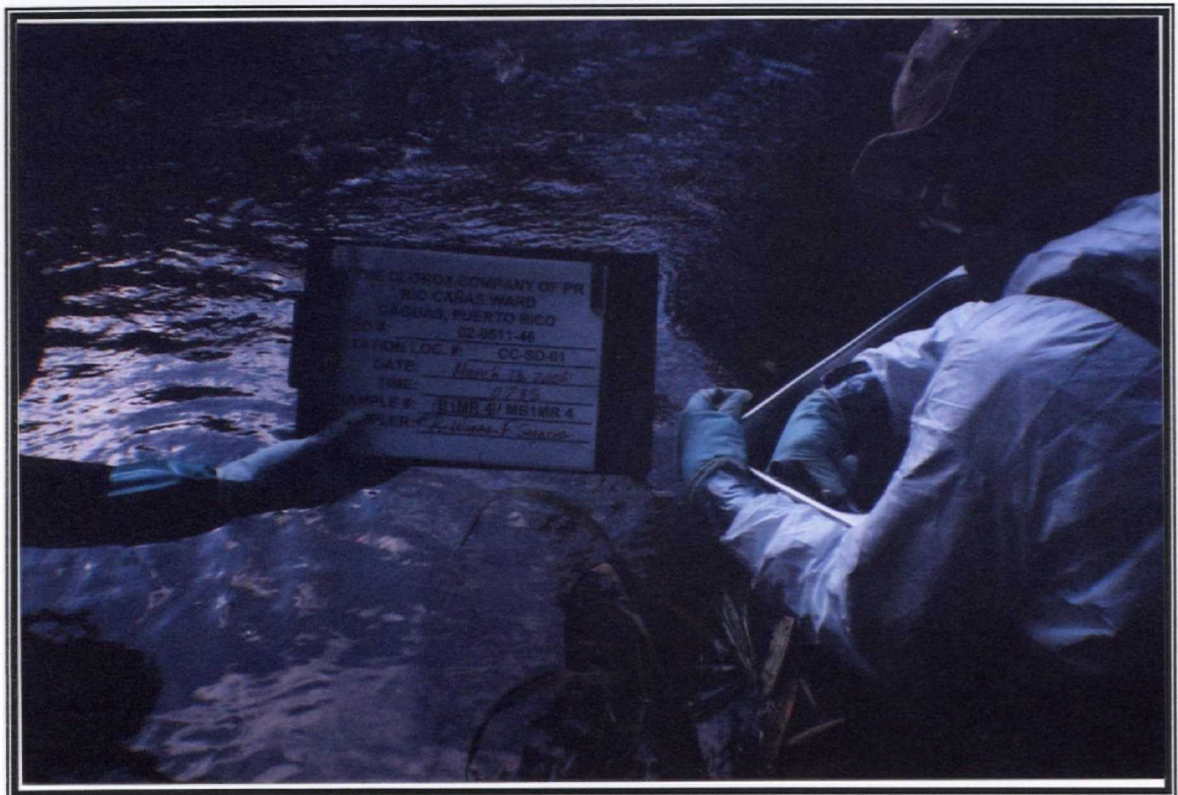


PHOTO 27





PHOTO 28



PHOTO 29





PHOTO 30

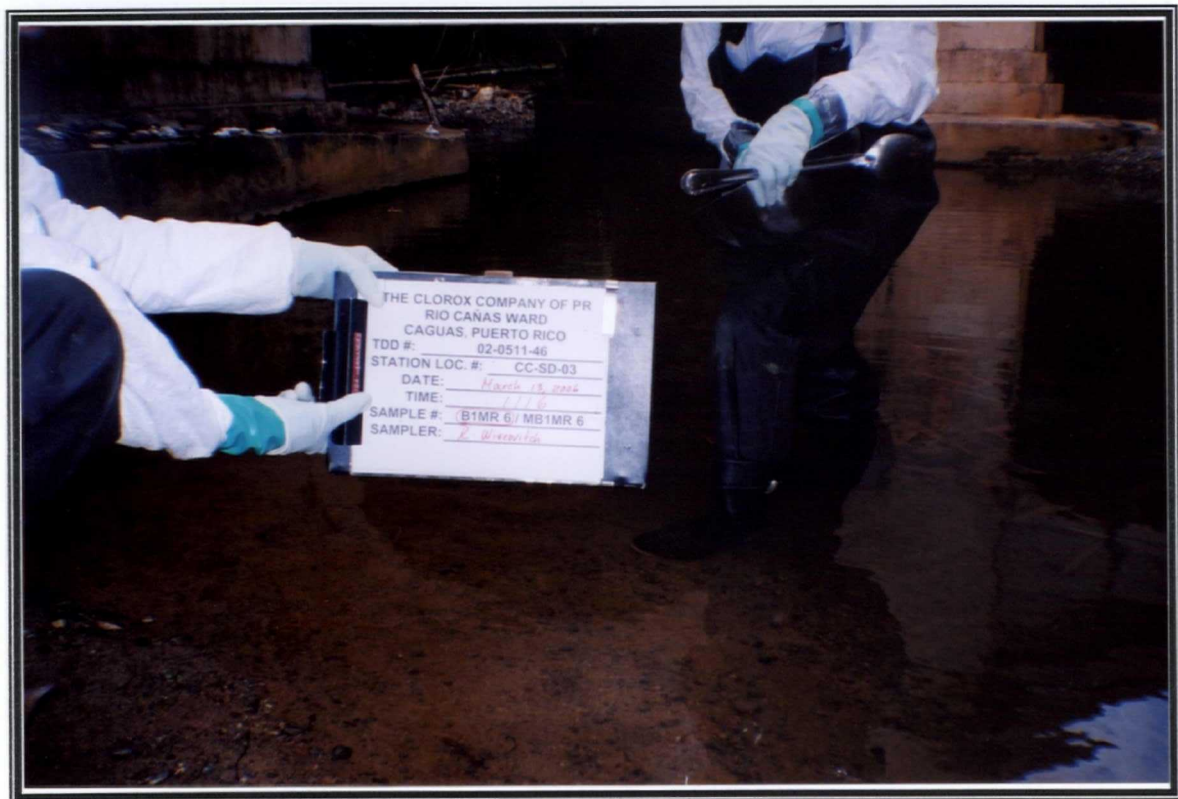


PHOTO 31

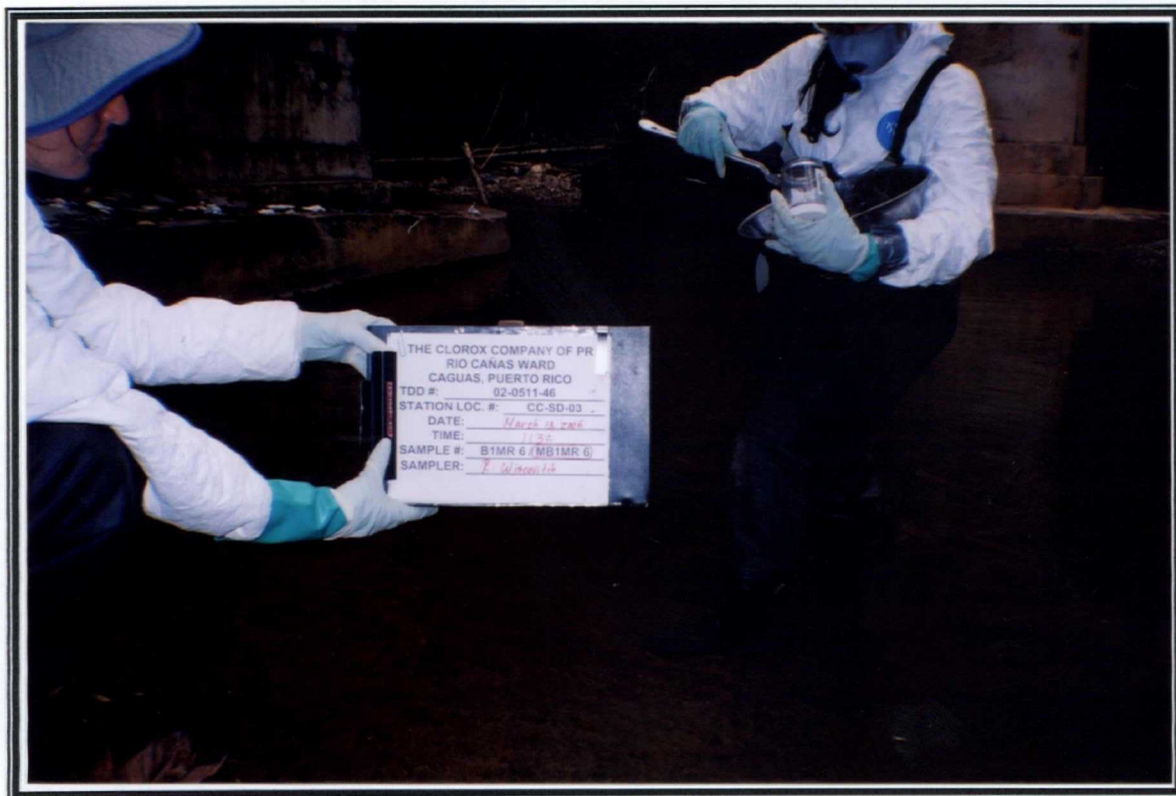


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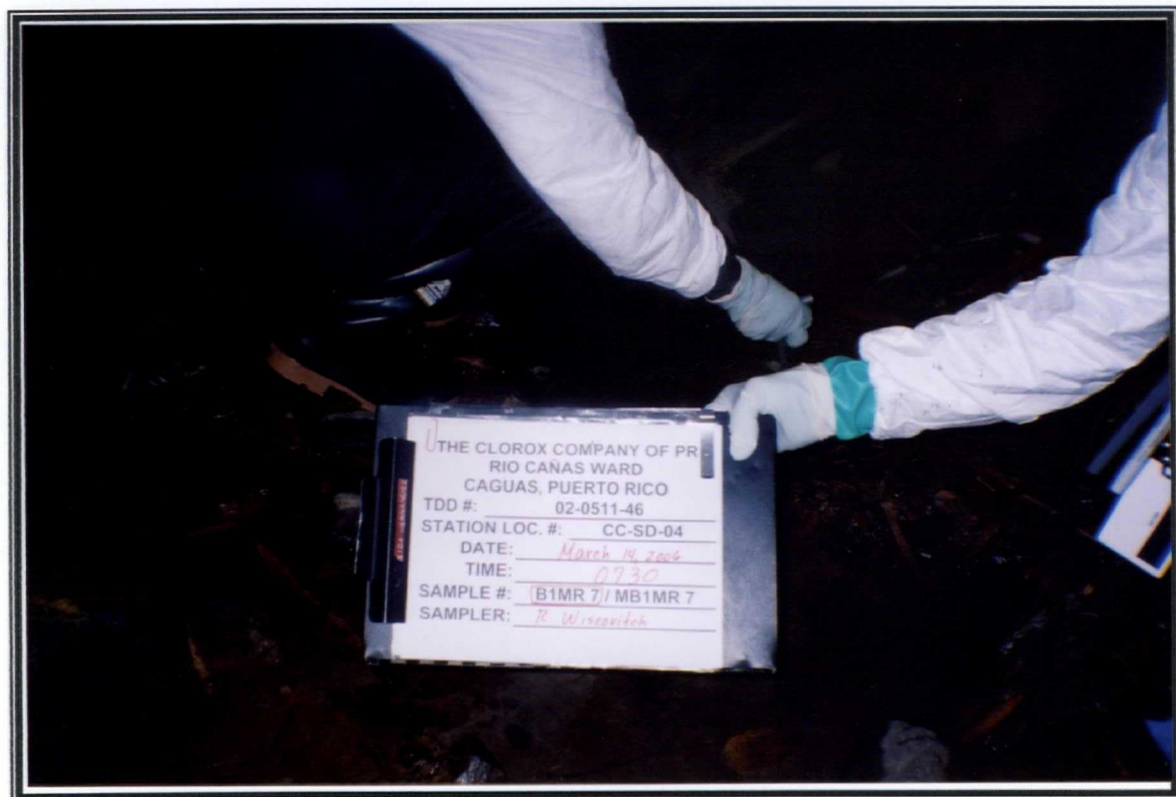


PHOTO 33



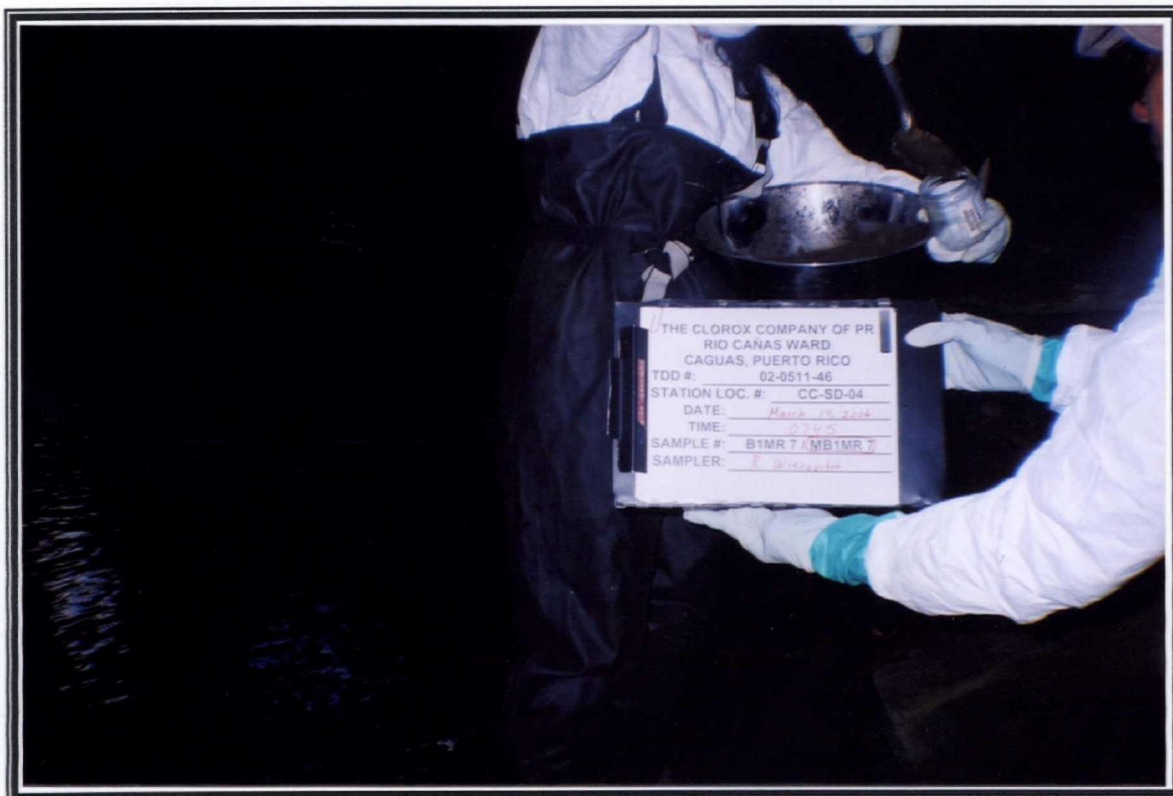


PHOTO 34



PHOTO 35



PHOTO 36



PHOTO 37





PHOTO 38



PHOTO 39



PHOTO 40



PHOTO 41





PHOTO 42



PHOTO 43



PHOTO 44



PHOTO 45



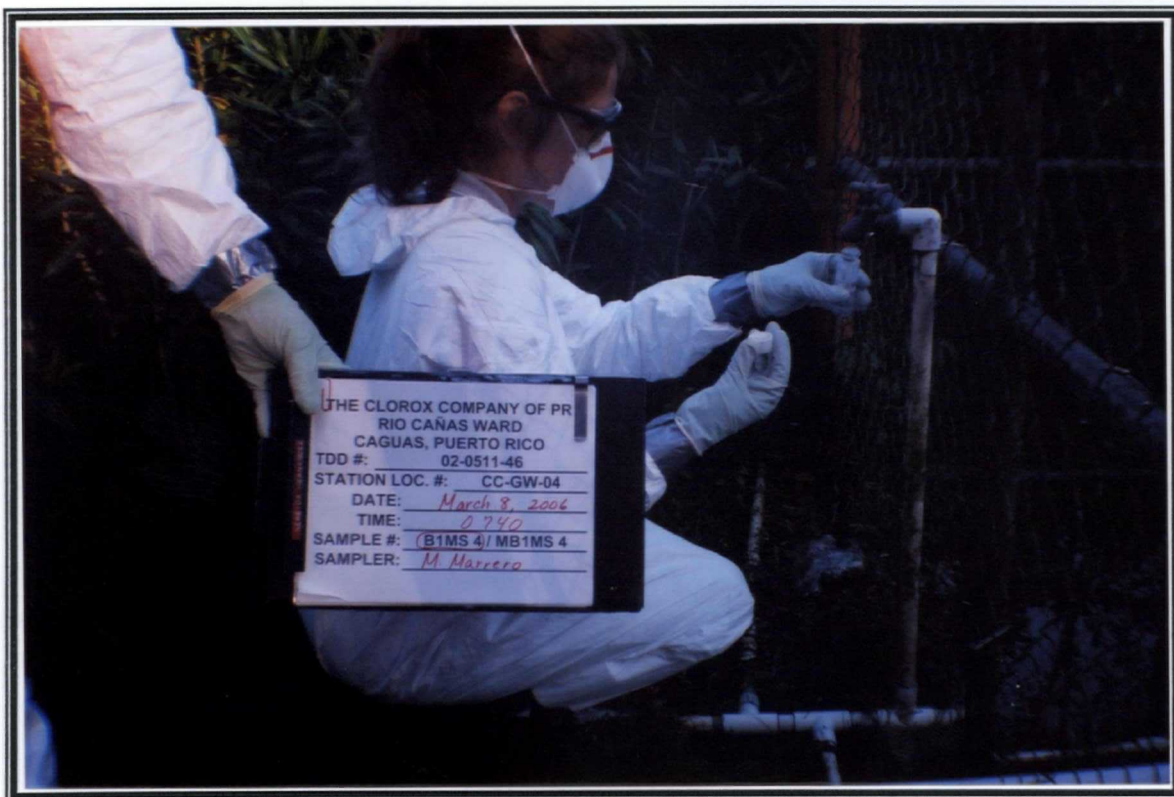


PHOTO 46



PHOTO 47



PHOTO 48



PHOTO 49





PHOTO 50



PHOTO 51





PHOTO 52



PHOTO 53





PHOTO 54

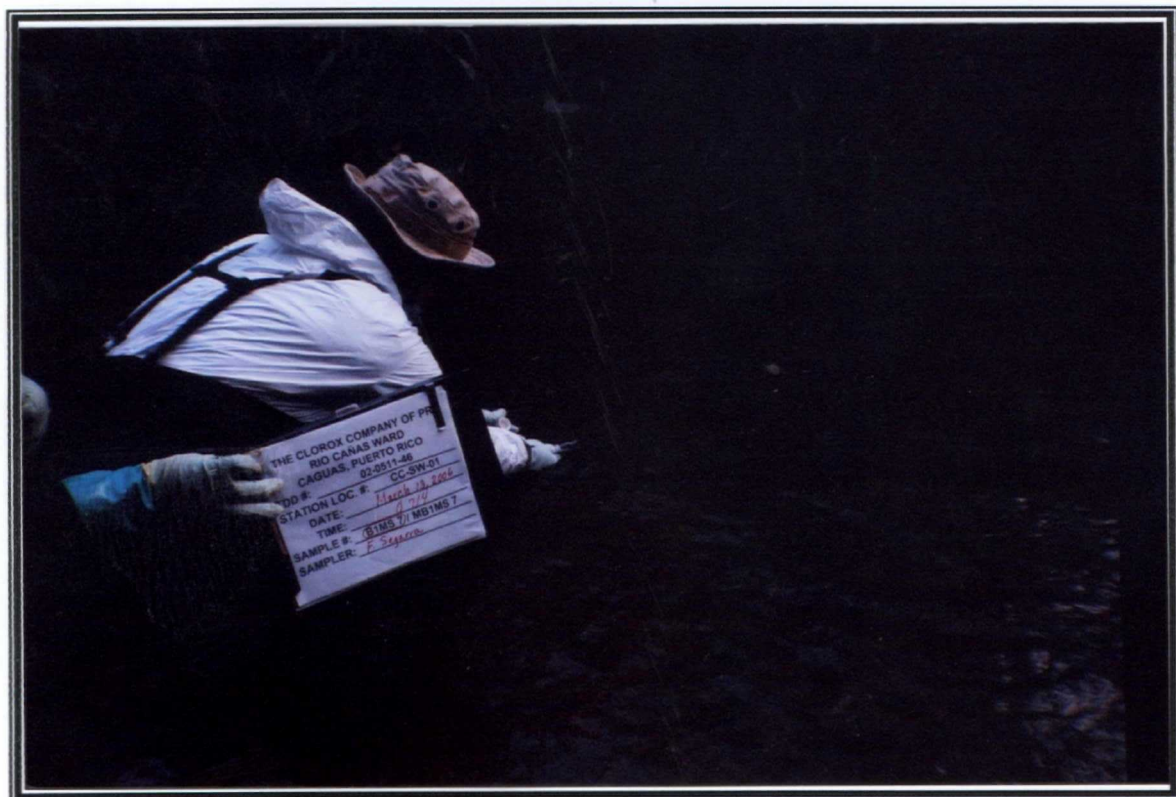


PHOTO 55





PHOTO 56

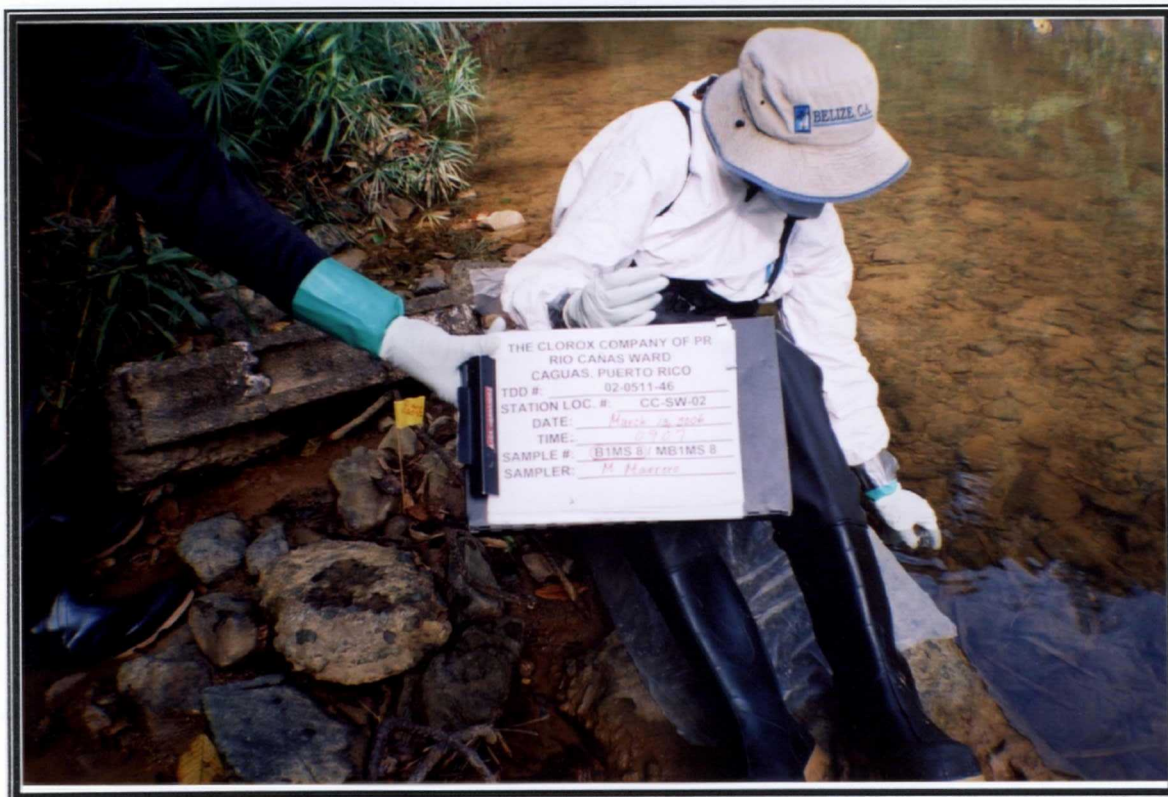


PHOTO 57





PHOTO 58



PHOTO 59





PHOTO 60



PHOTO 61

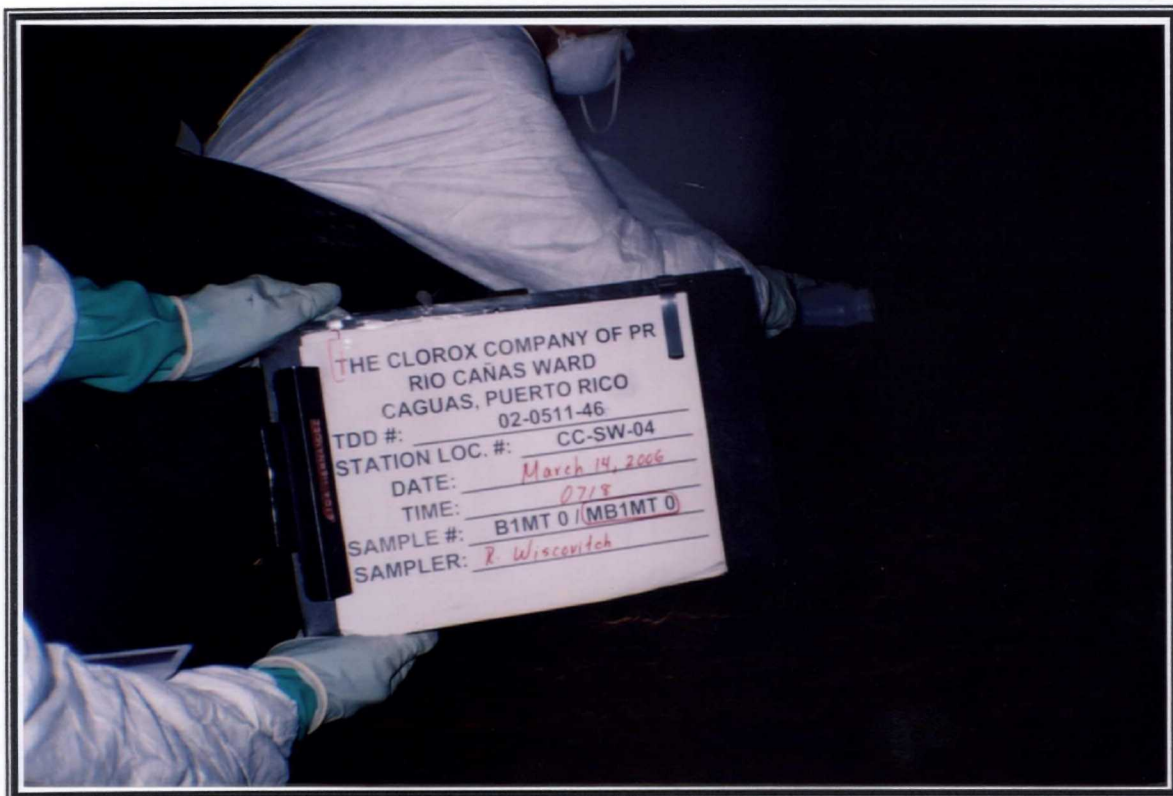


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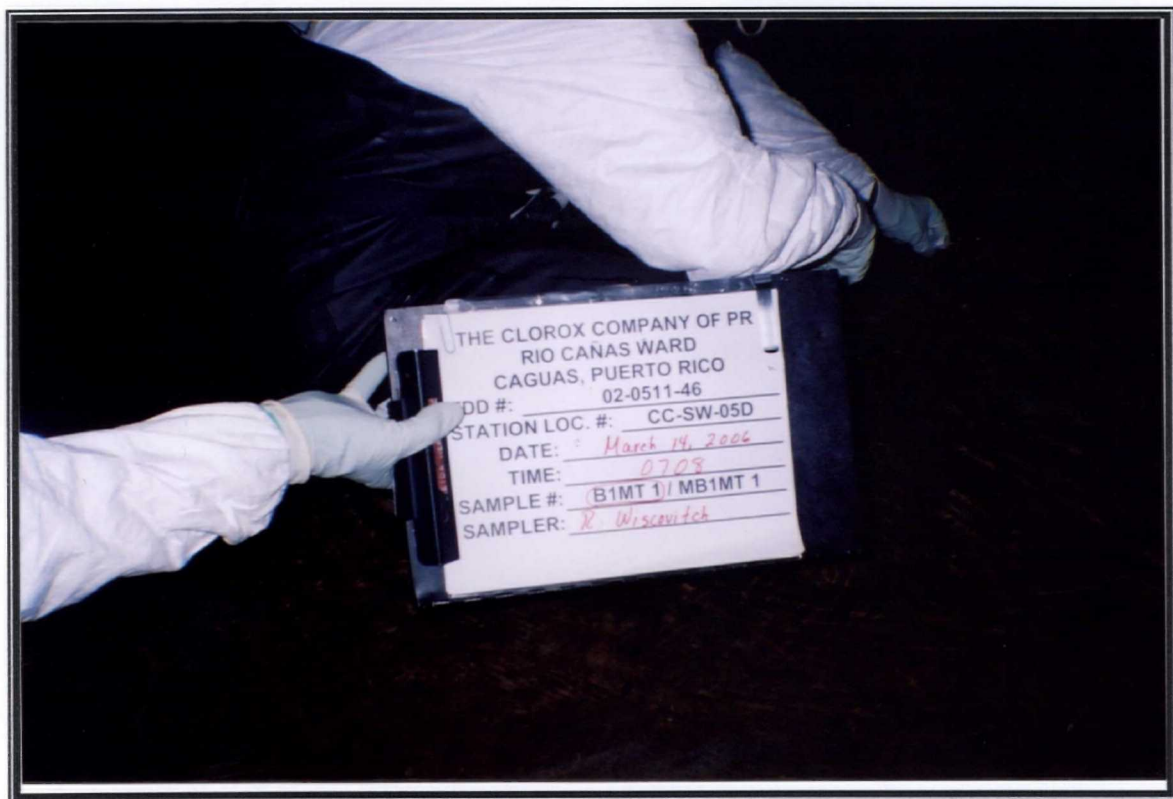


PHOTO 63



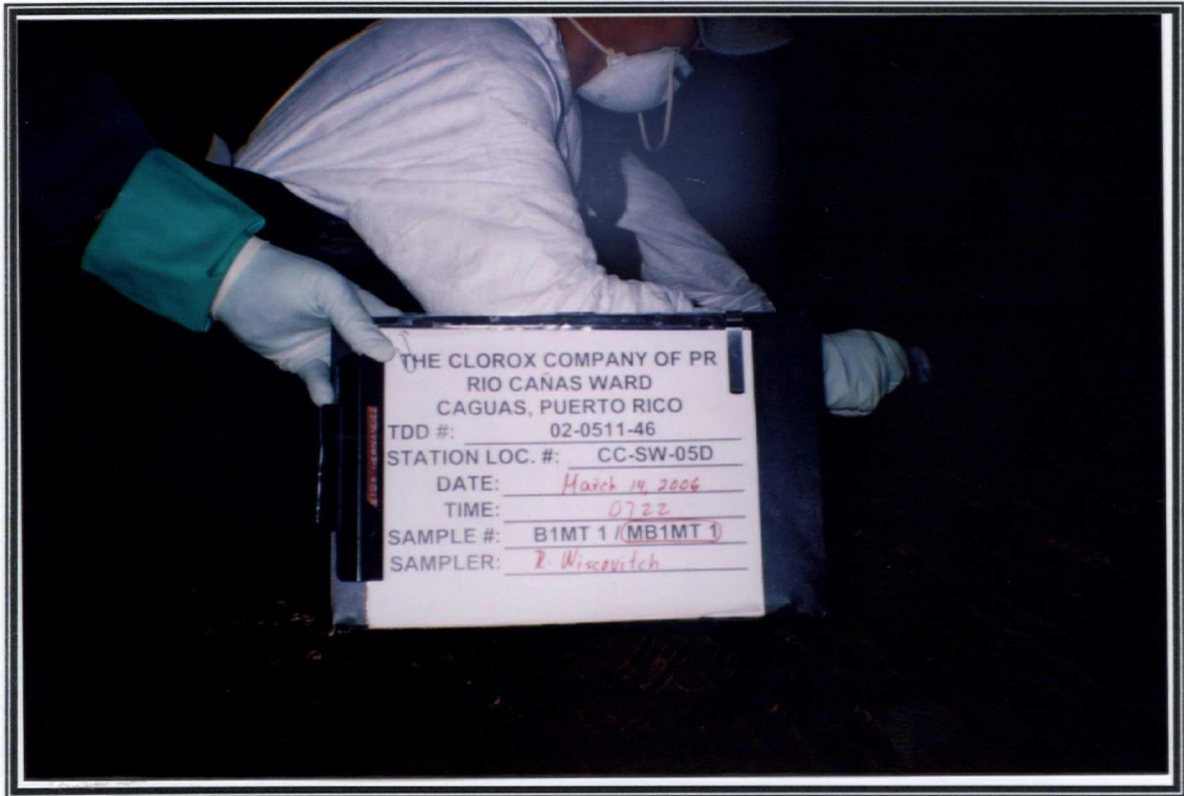


PHOTO 64



PHOTO 65

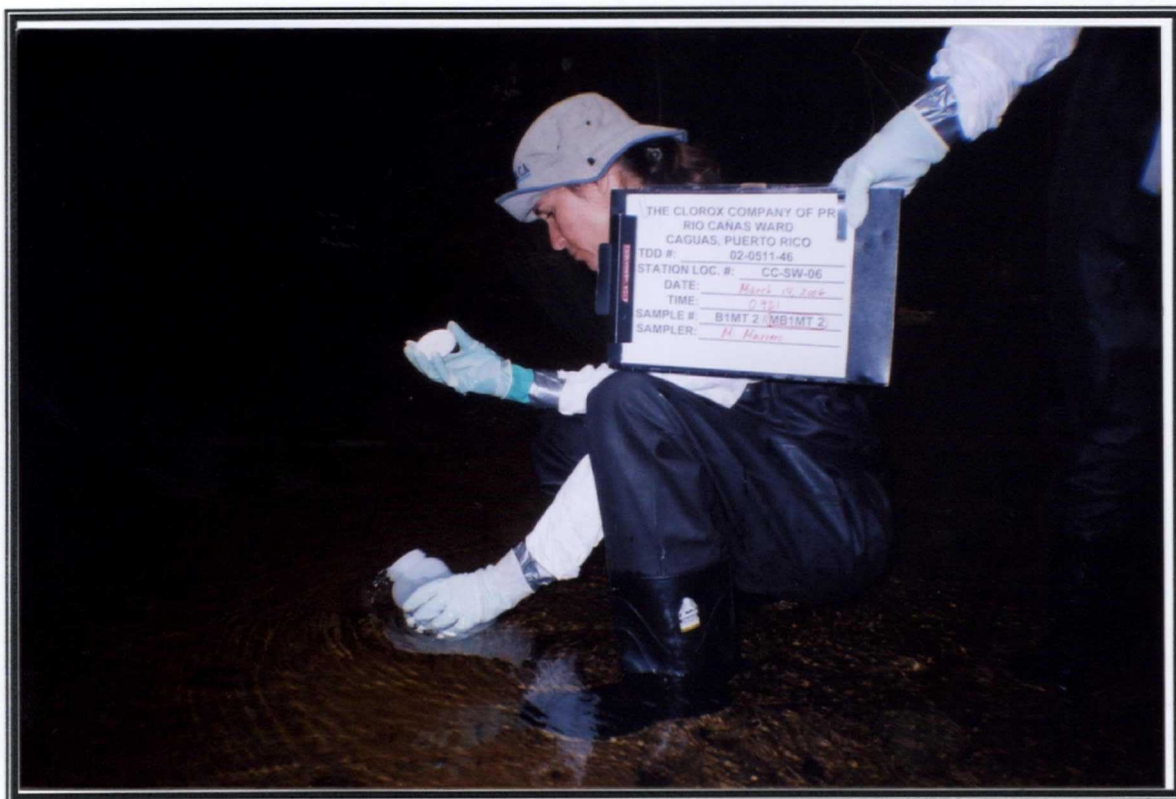


PHOTO 66



PHOTO 67



PHOTO 68





PHOTO 69





PHOTO 70



PHOTO 71



PHOTO 72